JAPANESE [JP,11-065848,A]

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS

[Translation done.]

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CLAIMS

[Claim(s)]
[Claim 1] Two or more image formation equipments which have a means to read a manuscript, and a means to print the image read by this means are connected through a network. A connection actuation means to transmit and print the image information read by one set of the arbitration of the two or more image formation equipments to different image formation equipment, In the image formation equipment network system which has a means to choose independent actuation or connection actuation The image formation equipment network system characterized by establishing the control program rewriting means which transmits the control program of one image formation equipment of arbitration to other image formation equipments using said connection actuation means, and rewrites the control program.
[Claim 2] The image formation equipment network system characterized by having a means by which said control program rewriting means rewrites to coincidence the program of all the image formation equipments connected by said connection actuation means in an image formation equipment network system according to claim 1.
[Claim 3] an image formation equipment network system according to claim 2 -- setting -- said -- others -- the image formation equipment network system characterized by having a means to permit rewriting of the control program which led said connection actuation means only when image formation actuation ended image formation equipment or image formation actuation was omitted.
[Claim 4] A means to read a manuscript, and a means to print the image read by this means, Two or more image formation equipments which have the exterior and the external means of communications which communicates are connected through a network through communication lines, such as a public line. A connection actuation means to transmit and print the image information read by one set of the arbitration of the two or more image formation equipments to different image formation equipment, In the image formation equipment network system which has a means to choose independent actuation or connection actuation Said one external means of communications of said image formation equipment which is bases receives the control program of equipment from the exterior. The image formation equipment network system characterized by establishing the control program rewriting means which rewrites the control program of two or more image formation equipments using said connection actuation means.
[Claim 5] The image formation equipment which receives a control program from the exterior in an image formation equipment network system according to claim 4 is an image formation equipment network system characterized by considering as the image formation equipment which omits image formation actuation.
[Claim 6] It is the image formation equipment network system characterized by carrying out when image formation actuation of target image formation equipment ends rewriting of the control program by said control program rewriting means in an image formation equipment network system according to claim 4 or image formation actuation is omitted.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] About an image formation equipment network system, especially this invention has a connection actuation means, and relates to the image formation equipment network system which can share printing with two or more image formation equipments.
[0002]
[Description of the Prior Art] Although image formation equipments, such as a copying machine, facsimile apparatus, and a printer, are used abundantly, there are some to which two or more image formation equipments were connected through the network in these. There are some which can perform connection actuation with two or more image formation equipments in such an image formation equipment network system.
[0003] In case connection actuation copies 100 manuscripts of one sheet, it is the function in which carrying out the exchange of other image formation equipments and information, and printing every 50 per set with two image formation equipments etc. shares an activity, and the image formation equipment which was able to give the activity shortens working hours.
[0004] It has the control program rewriting means by a memory card etc., respectively, and in case a control program is rewritten, the operator is usually carrying out to each image formation equipment in such an image formation equipment network system using the control program rewriting means for every image formation equipment.
[0005] Moreover, although the system which has the exterior and the external means of communications which communicates also has image formation equipment which constitutes an image formation equipment network system in this way through communication lines, such as a public line, the main functions of the external means of communications in that case are functions to tell the situation of failure or equipment to management equipments, such as a service center.
[0006]
[Problem(s) to be Solved by the Invention] Since the operator had to do the rewriting activity by handicraft to each image formation equipment using a control program rewriting means by which it is attached at a time to one set as mentioned above when rewriting the control program of each image formation equipment in such an image formation equipment network system, serious time and effort and time amount had been required. This invention aims at enabling it to perform easily and efficiently rewriting of the control program of each image formation equipment which constitutes a network system in view of such a problem using a connection actuation means.
[0007] Furthermore, in the case of the network system by the image formation equipment which has the above external means of communications, it aims at enabling it to rewrite the control program of each image formation equipment much more efficiently using the external means of communications.
[0008]
[Means for Solving the Problem] In order that this invention may attain the above-mentioned purpose, two or more image formation equipments which have a means to read a manuscript, and a means to print the image read by this means are connected through a network. A connection

actuation means to transmit and print the image information read by one set of the arbitration of the two or more image formation equipments to different image formation equipment, In the image formation equipment network system which has a means to choose independent actuation or connection actuation The control program rewriting means which transmits the control program of one image formation equipment of arbitration to other image formation equipments using the above-mentioned connection actuation means, and rewrites the control program is established.

[0009] Furthermore, it is good to make it have a means by which the above-mentioned control program rewriting means rewrites to coincidence the program of all the image formation equipments connected by the above-mentioned connection actuation means. Moreover, only when image formation actuation is completed or image formation actuation is omitted, as for image formation equipment besides the above, it is desirable to make it have a means to permit rewriting of the control program which led the connection actuation means.

[0010] When the image formation equipment of the above-mentioned network system has the exterior and the external means of communications which communicates through communication lines, such as a public line, one external means of communications of two or more image formation equipments which constitute a network system can receive the control program of equipment from the exterior, and the control program rewriting means which rewrites the control program of two or more image formation equipments using the above-mentioned connection actuation means can be established.

[0011] In that case, the image formation equipment which receives a control program from the exterior is good to consider as the image formation equipment which omits image formation actuation. Moreover, as for rewriting of the control program by the above-mentioned control program rewriting means, it is desirable to carry out, when image formation actuation of target image formation equipment is completed or image formation actuation is omitted.

[0012]

[Embodiment of the Invention] Hereafter, the gestalt of implementation of this invention is explained using a drawing. The copying machine system which is 1 operation gestalt of the image formation equipment which constitutes the image formation equipment network system by this invention in drawing 2 is shown. This copying machine system carried the automatic manuscript feed gear (it is called "ADF" for short below) 2 in the upper part of the body 1 of a copying machine, and has connected to a flank the finisher 100 who is after-treatment equipment. The near-side top face of the body 1 of a copying machine is equipped with the actuation display 30 shown in drawing 3 .

[0013] First, the usual copy actuation by this copying machine system is explained. As for the manuscript bundle put on the manuscript base 20 of ADF2 by turning the image side of a manuscript up, a push on the print key 34 on the actuation display 30 (start key) feeds the position on contact glass 6 with the bottom manuscript with the feed roller 3 and the feed belt 4.

[0014] After reading the image data of the manuscript on contact glass 6 by the reading unit 50, the manuscript which the reading ended is discharged by the top face of ADF2 with the feed belt 4 and a discharge roller 5. Furthermore, when it is detected by the manuscript set detection sensor 7 that the following manuscript is on the manuscript base 20, it is fed with the following manuscript on contact glass 6 like ****. The feed roller 3, the feed belt 4, and a discharge roller 5 are driven by the common motor which is not illustrated.

[0015] Paper is respectively fed to the transfer paper loaded into the 1st tray 8 within the body 1 of a copying machine, the 2nd tray 9, and the 3rd tray 10 by the 1st feeding unit 11, the 2nd feeding unit 12, and the 3rd feeding unit 13, and it is conveyed to the location which contacts a photo conductor 15 by the vertical conveyance unit 14.

[0016] The image data read by the reading unit 50 is written in a photo conductor 15 by the laser beam from the write-in unit 57, and a toner image is formed by passing the development unit 27. And while a transfer paper is conveyed with the conveyance belt 16 at rotation of a photo conductor 15 and uniform velocity, the toner image on a photo conductor 15 is imprinted. Then, an image is established in the fixing unit 17 and it is discharged by the finisher 100 of

after-treatment equipment by the delivery unit 18.
[0017] A finisher 100 can usually lead the transfer paper conveyed with the delivery roller 19 of the body 1 of a copying machine in the direction of the delivery roller 102, and the direction of the staple processing section. By changing the change plate 101 upwards, it can convey on the staple base 108 via the conveyance roller 105,107. Whenever paper is delivered to one sheet, a paper end side is arranged by the jogger 109 for ******, and the transfer paper loaded into the staple base 108 is filed by the stapler 106 with a part of completion of a copy. The transfer paper group filed with the stapler 106 falls on the staple completion paper output tray 110, and is contained by self-weight there.
[0018] on the other hand, the usual paper output tray 104 is ******** in simple about the copy paper which moves forward and backward for every copy section by which is a movable paper output tray and sorting was carried out to the cross direction (direction perpendicular to the space of drawing 2) with every manuscript and the image memory, and is discharged with the delivery roller 103.
[0019] It once stocks to the double-sided feeding unit 111 by setting the branching pawl 112 for a path change to the bottom without leading the transfer paper which paper was fed to while from each medium trays 8-10, and was formed by the field to a paper output tray 104 side, when forming an image to both sides of a transfer paper.
[0020] Then, in order that the transfer paper stocked by the double-sided feeding unit 111 may imprint the toner image again formed by the photo conductor 15, paper is re-fed from the double-sided feeding unit 111, and an image is imprinted by the field of another side. The branching pawl 112 is set to the bottom at this time, and the transfer paper with which the image was formed in both sides is led to a paper output tray 104. Thus, when creating an image in both sides of a transfer paper, the double-sided feeding unit 111 is used.
[0021] A photo conductor 15, the conveyance belt 16, the fixing unit 17, the delivery unit 18, and the development unit 27 are driven by the Maine motor which is not illustrated, and the driving force of the Maine motor transmits and drives each feed units 11-13 with a feed clutch respectively. The driving force of the Maine motor transmits and drives the vertical conveyance unit 14 through a middle clutch.
[0022] Drawing 3 is drawing showing the layout of the actuation display 30 prepared in the body 1 of a copying machine of this copying machine system. The liquid crystal touch panel 31, a ten key 32, the clearance/stop key 33, the print key 34, the mode clear key 35, and the initialization key 36 are shown in this actuation display 30, and information, a key, etc. for the message which shows the condition of various function keys, and a number of copies and this copying machine system, and the control program rewriting actuation by this invention are displayed on the liquid crystal touch panel 31.
[0023] Drawing 1 is drawing showing the example of a display of the liquid crystal touch panel 31 of this actuation display 30. When an operator touches the key displayed on the liquid crystal touch panel 31, the key which shows the selected function is reversed black. Moreover, when the detail of a function must be specified (for example, if it is variable power variable power value etc.), the setting screen of a detail function is displayed by touching the key. Thus, since the dot drop is being used for the liquid crystal touch panel 31, it can perform the optimal display at that time graphically.
[0024] In the example of a display shown in drawing 1 , the message area which displays the message of "it can copy", and "waiting" etc. is established in the upper left, a double key, such as specifying the scale factor of the copy number-of-sheets display which displays the set number of sheets, the automatic concentration key which adjusts image concentration automatically to the bottom of it, the automatic form selection key which chooses a transfer paper automatically, and actual size, is located in a line, and the right is displayed.
[0025] furthermore, the 2nd step from the bottom -- right-hand side to a copy -- a part -- every -- a page -- order -- the key which specifies when performing the sort key which specifies the processing to arrange, the stack key which specifies the processing which classifies a copy for every page, the staple key which specify the processing which files a part of thing by which sorting application was carried out every, and the control program rewriting

actuation concerning this invention is displayed side by side.
[0026] And the printing key which sets up printing of the intensive key, stamp and date for setting up both sides/split key, and intensive copy mode which set up the variable power key, double-sided mode, or division mode which sets expansion/reduction percentage to the bottom from right-hand side, a page, etc. is displayed. In addition, as for the mode specified, a half-tone-dot-meshing indication of the key is given. Moreover, processing when a program rewriting actuation key is specified is explained to a detail later on.
[0027] Actuation until it carries out latent-image formation of image reading and the image by this copying machine system on a photo conductor side here using drawing 2 again is explained. A latent image is potential distribution which produces an image by changing and irradiating optical information on a photo conductor side.
[0028] The reading unit 50 is constituted by the contact glass 6 and the optical scan system which lay a manuscript, and is constituted from the exposure lamp 51, the 1st mirror 52, the 2nd mirror 55, the 3rd mirror 56, a lens 53, and CCD series 54 grade by the optical scan system. The exposure lamp 51 and the 1st mirror 52 are fixed on the 1st carriage which is not illustrated, and the 2nd mirror 55 and the 3rd mirror 56 are being fixed on the 2nd carriage which is not illustrated.
[0029] When reading a manuscript image, the 1st carriage and the 2nd carriage are mechanically scanned with the relative velocity of 2 to 1 so that the optical path length may not change. This optical scan system is driven by the scanner motor which is not illustrated. A manuscript image is read by CCD series 54, is changed into an electrical signal and processed. An image scale factor changes by moving a lens 53 and CCD series 54 to a longitudinal direction in drawing 1 . That is, corresponding to the specified scale factor, a location is set as the longitudinal direction of a lens 53 and CCD series 54.
[0030] The write-in unit 57 consisted of a laser output unit 58, an image formation lens 59, and a mirror 60, and equips the interior of the laser output unit 58 with the rotating polygon (polygon mirror) which carries out high-speed constant-speed rotation by the laser diode and motor which are a laser light source. The laser beam irradiated from the laser output unit 58 is deflected by the polygon mirror which carries out constant-speed rotation, passes along the image formation lens 59, is turned up by the mirror 60, and carries out condensing image formation on the front face of a photo conductor 15.
[0031] An exposure scan is carried out in the direction which a photo conductor 15 rotates, and the direction (main scanning direction) which intersects perpendicularly, and the deflected laser beam records the Rhine unit of the picture signal outputted from the selector 64 of the image-processing section shown in drawing 9 mentioned later. By repeating horizontal scanning with the predetermined period corresponding to the rotational speed and recording density of a photo conductor 15, an image (electrostatic latent image) is formed on the front face of a photo conductor 15.
[0032] As mentioned above, the laser beam outputted from the laser output unit 58 of the write-in unit 57 is irradiated by the photo conductor 15 of an image imaging system. Although not illustrated in the location where the laser beam near the end of a photo conductor 15 is irradiated, the beam sensor which generates a horizontal-scanning synchronizing signal is arranged. The control signal for outputting and inputting the picture signal which the image recording initiation timing of a main scanning direction controls and mentions later based on the horizontal-scanning synchronizing signal generated by the beam sensor is generated.
[0033] Next, the configuration of the image-processing section (image reading section and image write-in section) in this copying machine system is explained using drawing 4 . The light emitted from the exposure lamp 51 shown in drawing 2 irradiates a manuscript side, carries out image formation of the reflected light from a manuscript side with a lens 53, receives light and carries out photo electric conversion with CCD series 54, by A/D converter 61, is changed into the digital signal of binary or a multiple value, and is quantized. After a shading compensation is made by the shading compensation section 62, as for the picture signal changed into the digital signal, image amendment of MTF amendment, gamma amendment, etc. is made by the MTF-gamma amendment section 63.

[0034] In addition, a shading compensation is amending the variation in the exposure nonuniformity of the light source which irradiates a manuscript, and the sensibility of CCD series. MTF amendment is amending dotage by optical system, and gamma amendment is amending the nonlinearity of the sensibility of CCD series.
[0035] In a selector 64, the change which uses the destination of a picture signal as the variable power section 71 or the memory controller 65 is performed. According to the rate of variable power, enlarging or contracting of the picture signal which went via the variable power section 71 is carried out, and it is sent to the write-in unit 57. It has composition which can output and input a picture signal bidirectionally between the memory controller 65 and the selector 64.
[0036] The two printing composition sections 72 and 73 are formed in this image-processing section (IPU) so that the printing data generated by the printing image-data generator (printing unit) 74 based on the image data (for example, data outputted from data processors, such as a personal computer) supplied from the outside besides the image data which was shown in drawing 2 , and which reads and is inputted from a unit 50 can also be processed.
[0037] This image-processing section is equipped with I/O Port 75 which serves as data with ROM69 and RAM70 which store CPU68 which performs setup to the memory controller 65 etc., and control of the reading unit 50 and the write-in unit 57, and its program and data, and the exterior, and an interface of the address further, and the SCSI (Small computer system interface) driver 76. This CPU68 can perform writing and read-out of the data of an image memory 66 through the memory controller 65.
[0038] In addition, although illustration is omitted, this copying machine system is equipped also with the communications control circuit which is the external means of communications which connects with a public line etc. and communicates with the exterior.
[0039] Here, the picture signal for 1 page in the selector 64 of drawing 4 is explained using drawing 5 . In drawing 5 , a frame gate signal / FGATE expresses the shelf-life of the direction of vertical scanning of 1-page image data. A horizontal-scanning synchronizing signal / LSYNC is the horizontal-scanning synchronizing signals in every line, is the predetermined clock after this signal falls, and becomes effective [a picture signal]. The signals which show that the picture signal of a main scanning direction is effective are a line gate signal / LGATE.
[0040] These signals synchronize with pixel clock signal VCLK, and 1-pixel data are sent to one period of VCLK. This image-processing section has the generating means of separate frame gate signal / FGATE, a horizontal-scanning synchronizing signal / LSYNC, a line gate signal / LGATE, and pixel clock signal VCLK to an image input and each output, and the combination of various image I/O becomes realizable.
[0041] The detail of the memory controller 65 in drawing 4 and an image memory 66 is explained using drawing 6 . The memory controller 65 has the input data selector 81, 82 or primary image composition section compression / expanding section 83, and 84 or secondary output data selector compression / expanding section 85. A setup of the control data to these each part is performed by CPU68 shown in drawing 4 . The address and data in drawing 6 show image data, and the address of the data connected to CPU68 is not illustrated.
[0042] An image memory 66 consists of the primary secondary storage 86 and 87. Primary storage 86 uses the memory in which rapid access, such as DRAM, is possible so that an abbreviation synchronization may be carried out and data read-out from the data writing to memory or the memory at the time of an image output can carry out to an input image data transfer rate at a high speed.
[0043] Moreover, the magnitude of the image data which processes divided primary storage 86 into two or more area, and it has taken the configuration (interface section with a memory controller) which can be performed to coincidence for I/O of image data. In order to enable activation of an image entry of data and an output to juxtaposition respectively in the divided each area, 2 sets of address data lines, the object for a lead and the object for lights, are connected to the interface with the memory controller 65. Thereby, while inputting an image into a certain area (light), actuation of outputting an image from other area (lead) is attained.
[0044] Secondary storage 87 is mass memory which saves data, in order to perform composition and sorting of the inputted image. If primary storage 86 and secondary storage 87 use the

memory device in which rapid access is possible, it has the primary composition [secondary] of using a cheap mass record medium and performing processing of a I / O data through primary storage although data can be processed fair, control also becomes comparatively easy and an access rate is not so quick to secondary storage 87 since components, such as DRAM, are expensive.

[0045] By adopting the configuration of the above image memory, it becomes possible to realize the image formation equipment which can process I/O of a lot of image data, preservation, processing, etc. with a comparatively easy cheap and configuration.

[0046] Next, the outline of actuation of this memory controller 65 is explained. First, an image input (preservation to an image memory) is explained. The input data selector 81 chooses the image data which performs the writing to the primary storage [from] 86 of an image memory 66 among two or more data.

[0047] The image data chosen by the input data selector 81 is supplied to the image composition section 82, and performs composition with the data already saved in the image memory 66. The image data processed by the image composition section 82 compresses data by primary compression / expanding section 83, and writes the data after the compression in primary storage 86. After the data written in primary storage 86 compress further in secondary compression / expanding section 85 if needed, they are saved at secondary storage 87. [0048] At the time of an image output, the image data memorized by primary storage 86 is read. When the image used as the candidate for an output is stored in primary storage 86, the image data read from primary storage 86 is elongated in primary compression / expanding section 83, and the image data after the expanding or the image data after performing image composition with the image data after expanding and input image data is chosen and outputted by the output data selector 84.

[0049] The image composition section 82 processes selection (dual output to the output destination change of both write back to an image output and primary storage 86) of the output destination change of composition (it has the phase-adjustment function of image data) with the image data read from primary storage 86, and input image data, and the image data after composition etc.

[0050] When the image data used as the candidate for an output is not stored in primary storage 86, after reading the image data for an output stored in secondary storage 87, elongating in secondary compression / expanding section 85 and writing the image data after the expanding in primary storage 86, the same image output actuation as having mentioned above is performed.

[0051] Although copy actuation cannot be started in this system at the times under heating of the fixing unit which showed "reservation of operation" to drawing 2 in PPC (plain paper copier) etc., when the copy actuation of a fixing unit is attained after heating termination, it is the thing of the function automatically started in copy actuation by terminating mode setting and the present set and reserving.

[0052] With this operation gestalt, although under heating of a fixing unit is set as the object which can be reserved [of operation], about the thing whose actuation is attained with the passage of time besides this, it can be made an object. Under the toner supply actuation to the rise time of the medium tray in extensive feeding equipment, time amount until rotation of the polygon motor in write-in equipment is stabilized, and a development unit etc. can be considered.

[0053] Drawing 7 and drawing 8 are the hard block diagrams of other image formation equipments which carry out this invention. These image formation equipments consist of the image reading section A, the image write-in section B, a system controller C, the memory unit D, the user limiter machine E, the body detection sensor F, a control unit (it is the same as an actuation display) G, remote diagnostic equipment (CSS) H, and a clock I. However, the memory unit D is required only when realizing a memory function, and only considering realizing the usual copy function, it is not required.

[0054] Furthermore, if Clock I becomes a certain specific time amount, only when booting equipment or realizing weekly timer ability [shut / ability], it is required. Moreover, the body detection sensor F is required, only when the user has approached before this equipment at the

time of preheating mode and it realizes the function to cancel preheating mode automatically, and since the remote diagnostic equipment (CSS) H is a function which carries out a monitor from the telediagnosis, i.e., a remote place, it should be equipped with it only when such a function is required. However, even when not preparing this, it is necessary to prepare the communications control circuit for communicating with the exterior.

[0055] A system controller C is the generic name of the controller which controls scanner actuation, ON/OFF of the light source, etc., in order to supervise paper conveyance processing, electrophotography process processing, an abnormal condition, a sheet paper cassette condition, etc. in order to carry out image formation in the image write-in section B (detection of the existence of a form etc.) and to read the image of a manuscript in the image reading section A, when performing copy mode.

[0056] It is changing and reading an image into an electrical signal and restoring an electrical signal to the big description of a digital plain paper copier (plain paper copier) in the image write-in section (this also being called image formation equipment). At this time, it can apply now to the field which was not able to be realized by the conventional analog PPC by having a means to change the electrical signal of the read image variously and to transmit it.

[0057] For example, functions, such as FAX, a page printer, a scanner, and a file system, are realizable, and also, recently, performing the print of two or more sheets with one scan, or printing the image of two or more manuscripts on the transfer paper of one sheet is realized by once storing the image data read at the time of activation of a PPC function in stores, such as DRAM, and reading the pixel data if needed. These functions that can carry out digital-plain-paper-copier system no one but implementation are expressed as "extension" or an "application."

[0058] Furthermore, it not only carries one extension, but in the latest digital plain paper copier, it has come to carry two or more applications in coincidence. Thus, the digital plain paper copier which shares one resource is expressed as a "system", and the controller which controls this system is also called a "system controller."

[0059] A preheating is the mode in which power consumption is saved, by constant-temperature (for example, 10 degrees C)-lowering fixing temperature, controlling it, and erasing the display of a control unit G. A setup in this mode is automatically made after fixed time amount progress, after actuation and actuation are lost depending on the key input by the control unit G, and a setup. Discharge in this mode is canceled when it detects the key input by the control unit G, and that people stood in front of equipment by the body detection sensor F depending on the setup.

[0060] The DRAM block in the memory unit D in drawing 7 and drawing 8 is for memorizing the picture signal read in the image reading section A, according to the demand from a system controller C, is saved in the image write-in section B, and can transmit ******** image data.

[0061] The compressed block in the memory unit D possesses compression functions, such as MH, MR, and a MMR method, the once read image was compressed, and it has prepared them in order to aim at improvement in the utilization ratio of memory (DRAM). Moreover, rotation of an image is realizable by changing the read-out address and its direction of [from the image write-in section B].

[0062] The user limiter machine E is formed in order to specify limit a user since PPC which is using the electrophotography process has much consumption of an article of consumption, or to manage the use number of sheets of a transfer paper for every user and every use post of its, and it has what uses a "coin rack", a "key counter", a "keycard", a "prepaid card", etc., the thing which uses a password code.

[0063] The hard configuration of drawing 7 is performing control of the image reading section A, the image write-in section B, the memory unit D, and the remote diagnostic equipment H only by CPU in a system controller C. He gives CPU to the image reading section A, the image write-in section B, and the memory unit D, respectively, and is trying to, transmit the command from a system controller C to CPU of each part by the control signal line with the hard configuration of drawing 8 on the other hand. Thus, the hard configuration of the image formation system which carries out this invention can be performed freely.

[0064] Drawing 9 shows the example of the image formation device-management structure of a system which used remote diagnostic equipment (CSS). The network system by the management equipment Q currently installed in the service base and two or more image formation equipments P, such as PPC currently installed in a user's origin, is connected through the public line network N. Communication link control apparatus R for controlling the communication link with management equipment Q is installed in the user side, and each image formation equipment P of user origin is connected to this communication link control apparatus R.
[0065] Connection of Telephone TEL and facsimile apparatus FAX is attained at communication link control apparatus R, and installation is possible in the form inserted in a user's existing circuit. Although two or more image formation equipments P are connectable at communication link control apparatus R, of course, there may be an unit. These image formation equipments P do not need to be the things of isomorphism, and a different model is sufficient as them. Furthermore, things other than PPC may be used.
[0066] Here, it is made [that a maximum of five image formation equipments P are connectable and] one set [after / expedient / explaining / of a communication link control apparatus] R. Multidrop connection of communication link control apparatus R and two or more image formation equipments P is made by the RS-85 plan.
[0067] Communications control between communication link control apparatus R and each image formation equipment P is performed by the basic mode data transmission control means. By establishing a data link with the polling/selecting of the Sentra RAIZUDO control which made communication link control apparatus R the control station, the communication link with the image formation equipment of arbitration is attained. Each image formation equipment P can set up the discernment value of a proper now with an address selection switch, and the polling address of each image formation equipment P and the selecting address are determined by this.
[0068] While the image formation equipment P which carried out control program transmission from management equipment Q at image formation equipment P, and received it rewrites a self control program using this image formation device-management system, it is possible to also rewrite the control program of other image formation equipments P using the connection actuation means between each image formation equipment.
[0069] Drawing 10 shows the example of a system configuration of the network copy which is an example of an image formation equipment network system which carries out this invention. Although eight digital copiers are connected and connected by network by the network interface in this drawing, the number of the copying machine naturally connected does not need to limit. It is connectable with a public line network through a communication link control apparatus like the case of the image formation device-management system which showed this network to drawing 9 .
[0070] Next, the example of a hard configuration for realizing this invention is further explained using drawing 11 . Each digital plain paper copier shown in this drawing 11 - The hard configuration of I and II has taken the same configuration as a thing and abbreviation shown in drawing 7 , attaches the same sign of each part of drawing 7 , and that explanation is omitted. However, into the memory unit D of each digital plain paper copier, since the read image is transmitted on an external network or the image data from a network is saved in the DRAM block section in a memory unit, the SCSI controller was formed, respectively and it has been connected by SCSI as a network means.
[0071] For a network communication means, various means, such as using the TCP/IP communication link of an OSI reference model for data communication, can be considered, using Ethernet as a physical means with a natural thing. Moreover, the transfer of control command like a remote output command, a setting command, etc. which the condition of each PPC which exists on a network inside the plane notifies or mentions later can also be performed not to mention an image data transfer as mentioned above by using a configuration like drawing 11 .
[0072] Next, it is a digital plain paper copier about the image read in the image reading section A of digital-plain-paper-copier-I of this drawing 11 . - The connection actuation (remote output) transmitted to the image write-in section B of II is explained. Drawing 12 is the conceptual diagram of the software. "copy shown in drawing 12 -- an application -- " -- the application

which performs the copy sequence for performing copy actuation, and "input/output control" are Rhea (device driver) who does logic / physical conversion of the data.
[0073] A control unit controller is Rhea (Rhea who performs a LCD display, LED lighting / putting out lights, a key input scan, etc. with logical level) who performs MMI (Man Machine Interface), and a "circumference machine controller" is Rhea who performs control of the circumference machine with which PPC, such as an automatic double-sided unit, and a sorter, ADF, is equipped with logical level. An "image formation equipment controller", a "image reader controller", and a "memory unit" are as above-mentioned.
[0074] Moreover, the "daemon process" exists in image data read-out saved in the memory unit, and "image formation equipment" as application which performs the duty which transmits image data, when a print request is requested from other equipments on a network. Before a "daemon process's" reading image data from a memory unit with a natural thing and performing print actuation, the image transfer from other equipments on a network must be ended.
[0075] A control unit, a circumference machine, image formation equipment, an image reader, and a memory unit are treated here as a resource (resource) which each PPC holds. When "digital-plain-paper-copier-I" of drawing 11 performs copy actuation using each own resource (at the time of a print start key depression), each resource of a "circumference machine" and a "memory unit" is required from the "system controller" which performs system control "image formation equipment", a "image reader", or if needed.
[0076] a "system controller" -- "copy -- an application -- " -- from -- a demand -- receiving -- mediation of the royalty of a resource -- carrying out -- "copy -- an application -- " -- the mediation result (use propriety) is notified. all the resources that a system holds when "digital-plain-paper-copier-I" is used by the stand-alone (condition by which network connection is not carried out) -- all -- "copy -- an application -- " -- since it is in the condition which can be occupied, copy actuation is performed immediately.
[0077] In performing actuation with a pudding using the resource of another digital plain paper copier (henceforth a "remote digital plain paper copier") which exists on a network like this operation gestalt on the other hand, it requires the royalty of a resource from the "system control section" of a remote digital plain paper copier.
[0078] the "system controller" of a remote digital plain paper copier -- a demand -- following -- mediation of a resource -- carrying out -- "copy of the digital plain paper copier of the result demand-origin -- an application -- " -- it notifies. that "copy -- an application -- " -- when a royalty is permitted, after performing reading of an image and completing image storage into an own memory unit, an image transfer is performed to the memory unit of the digital plain paper copier of the remote output point through an external interface (this example SCSI).
[0079] After an image transfer is completed and transmitting the monograph affairs (feed opening, delivery opening, print number of sheets, etc.) for performing a print to the "daemon process" of the digital plain paper copier of the remote output point, a "print initiation" command is transmitted. If the "daemon process" of the remote output point receives a "print initiation" command, print initiation will be required from own (digital plain paper copier which performs a remote output) a "system controller", and a remote output will be performed by the "system controller."
[0080] when the memory unit of "digital-plain-paper-copier-II" is used by "digital-plain-paper-copier-I", in the memory unit of "digital-plain-paper-copier-II", use of the application of "digital-plain-paper-copier-II" (or the case where two or more digital plain papers copier are connected on a network as shown in drawing 10 -- digital plain papers copier other than "digital-plain-paper-copier-I") is improper.
[0081] The function hereafter made into a control program rewriting means, i.e., the description of this invention, to rewrite a control program using a connection actuation means, in each image formation equipment mentioned above with reference to the flow chart of drawing 13 - drawing 15 is explained. This function is made by the network interface indicated to be the system control section (system controller) shown in drawing 7 , the system controller C shown in 8 and 11, or drawing 12 to drawing 10 , drawing 11 , and drawing 12 .
[0082] First, the 1st operation gestalt of this invention is explained using the flow chart of

drawing 13 . This 1st operation gestalt functions as image formation equipment which each image formation equipment which constitutes a network system can connection operate [usual] usually. In addition, in each future flow chart, the "step" is written as "S." First, the flow chart shown in (a) of drawing 13 explains how to rewrite the control program of one image formation equipment manually. There are not the control program rewriting approach of the former [approach / this / itself] and a place where it changes.

[0083] If the image formation equipment which rewrites a control program is used as Equipment A, the power source of the equipment A will be turned OFF first (S1), and the ROM card with which the new control program rewritten in the predetermined location (slot) of the equipment A was recorded will be inserted (S2). Next, if it is made the power source ON of the equipment A (S3), a program rewriting actuation key will be displayed on the liquid crystal touch panel 31 shown in drawing 1 of the actuation display 30 shown in drawing 3 , and it will wait for the rewriting initiation by the touch (S4). Processing is ended, when it rewrites in predetermined time and initiation is not directed.

[0084] If it rewrites here and initiation is directed, will perform a control-panel lock (S5), it will be made not to receive the actuation input except being related with program rewriting by the actuation display 30 shown in drawing 3 after it till activity termination, the control program of a ROM card will be read, and the rewriting actuation of the control program currently written in the program memory within a body will be started (S6). This termination reboots Equipment A, applying body reset (S7).

[0085] Next, the flow chart shown in (b) of drawing 13 explains how to rewrite the control program of other image formation equipments (it considers as Equipment B) which are not rewritten yet using the connection actuation means from the equipment A in the condition that there is image formation equipment (the above-mentioned equipment A) already rewritten by the new control program.

[0086] First, by the actuation display 30 of Equipment B, the program transfer item in serviceman setting mode is chosen (S8), and the machine number of the equipment A which rewrote the control program is inputted (S9). A control-panel lock is performed after it (S10), and it indicates that it is [data] under reception to the actuation display 30, and is made not to receive an actuation input till activity termination. And after rewriting the control program which receives a control program and is written in the program memory within a body from Equipment A (S11) and completing this, Equipment B is rebooted, applying body reset (S12).

[0087] In this operation gestalt, Equipment B does not need to have a program rewriting means in the hand control by a flash ROM etc. Therefore, that what is necessary is just to have a program rewriting means in hand control, the image formation equipment of either of the image formation equipment network systems can use the rewriting means of the program effective also in rewriting of the control program of other image formation equipments, can make equipment of unnecessary hardware unnecessary, and can reduce cost.

[0088] Below, the flow chart of drawing 14 is used and the 2nd operation gestalt of this invention is explained. (a) of drawing 14 shows actuation of the equipment A which is image formation equipment of a control program transmitting side, and (b) shows actuation of the image formation equipment boiled a control program reception side. Also in this 2nd operation gestalt, each image formation equipment which constitutes a network system functions usually as image formation equipment in which the usual connection actuation is possible.

[0089] First, the actuation by the side of the equipment A which is image formation equipment equipped with the program rewriting means carries out a selection setup of all the device control program rewriting activation items in serviceman setting mode from the actuation display 30, as shown in the flow chart of (a) of drawing 14 (S21). The control panel of an actuation display is locked and it is made not to receive actuation of a user by that cause (S22).

[0090] Subsequently, the current condition of all the image formation equipments connected with the connection actuation means is checked in the small order of the equipment item number of an equipment proper (S23). A program version removes for program rewriting about the same equipment as Equipment A in that case. And if the existence of the equipment of a power-source OFF condition is checked (S24) and there is equipment of a power-source OFF condition,

the message which demands the power source ON of the equipment will be displayed on a control panel (S25). If there is no equipment of a power-source OFF condition, it will progress to step 26 as it is.

[0091] And it is judged as the candidate for rewriting, and rewrites to all equipments, a demand is transmitted (S26), and a control program is transmitted to all equipments after that (S27). However, when the equipment of the other party which transmitted the rewriting demand is image formation operating, it waits to end the image formation actuation and to be in a standby condition, and a control program is transmitted.

[0092] therefore -- the case where it judges whether the equipment of a receiving side has the waiting condition of the present equipment if a rewriting demand signal is received as shown in the flow chart of (b) of drawing 14 (S30) (S31), and it is in a standby condition -- immediately -- equipment A -- receiving -- a rewritable response -- transmitting (S32) -- in not being in a standby condition, it rewrites, after waiting until it will be in a standby condition, and transmits a response.

[0093] By it, the equipment A side mentioned above transmits control program data to the equipment at the order which received the rewritable response (S27). Body reset is performed, after the equipment of a receiving side rewrites the control program currently written in the program memory within a body if a control program is received from Equipment A (S33) (S34) and it is completed (S35).

[0094] When it carries out about all the equipments that rewrote this actuation and were judged to be objects and the rewriting activity of a control program is completed with all equipments, a completion message is displayed on the actuation display of Equipment A, and all actuation is completed.

[0095] Since each of that control program is once rewritable by actuation to all the image formation equipments connected by the connection actuation means according to this operation gestalt, compaction of much more simplification of a control program rewriting activity and working hours can be aimed at. Moreover, a dependability improvement of a control program replacement activity can be aimed at by having enabled it to perform reception and rewriting actuation of a control program, only when image formation equipment was waiting.

[0096] Next, the 3rd operation gestalt of this invention is explained using the flow chart of drawing 15 , and the block diagram of drawing 16 . Like the image formation device-management system mentioned above by drawing 9 , in addition to the network system to the 2nd operation gestalt, this 3rd operation gestalt prepares one communication link control apparatus R, as shown in drawing 16 , and it connects it with external communication device 122,122' prepared in each image formation equipment P which constitutes a network system, and P' through serial interface 131,131.

[0097] Image formation equipment P and P' control external communication-interface 132,132' with external communication device 122,122', and the connection interface 133 with other image formation equipments by the system controller C and C'. Communication link control apparatus R is connected with the service center (management equipment) Q through the public line N. Moreover, the connection interface 133 is superior to external communication-interface 132,132' or serial interface 131 in dependability or transmission speed.

[0098] In this image formation equipment network system, image formation equipment P and P' can receive the information from the outside that it was inputted through communication link control apparatus R, through the external communication device 122 or 122'. On the contrary, image formation equipment P or the information from P' lets the external communication device 122 or 122', and communication link control apparatus R pass, and is transmitted to the external service center Q.

[0099] Moreover, image formation equipment P performs image formation equipment P' and a communication link using the connection interface 133, the communication link of it is possible with the exterior through external communication device 122', image formation equipment P' can also perform a communication link with image formation equipment P using the connection interface 133, and it can communicate with the exterior through the external communication device 122. In addition, although this example shows the case where the network is formed by

two image formation equipments, of course, the number of image formation equipment is not limited to two sets.
[0100] The flow chart of drawing 15 explains control program rewriting actuation of the image formation equipment by this 3rd operation gestalt. Each image formation equipment P which constitutes a network system also from this 3rd operation gestalt, and P' function usually as image formation equipment in which the usual connection actuation is possible.
[0101] If the existence of the equipment under current standby is judged in image formation equipment P with external means of communications, and P' (S41) and there is no waiting equipment when communication link control apparatus R receives a program transfer request from a service center Q, it will rewrite to a service center Q and an improper response will be returned (S49). If there is waiting equipment, the rewritable response of the equipment (image-formation equipment P or P': consider as Equipment A) will be returned to a service center Q (S42).
[0102] And while displaying that it is [program] under rewriting on the control panel of the equipment A, user actuation invalid processing is carried out, and it is made not to receive actuation of a user (S43).
[0103] Then, the data of the control program for rewriting to receive are transmitted to Equipment A through the external communication device 122 or 122' from a service center Q (S44). The equipment A which received the control program writes the control program in un-volatilizing [which is program memory / ROM], and resets a body (S45). Rewriting of the control program of Equipment A is completed by this.
[0104] Next, the control program of this equipment A and other equipments n which can be communicated is rewritten one by one. First, it confirms whether the first equipment n is waiting (S46), and n will be changed into the number of the equipment of a degree if not waiting (S50). When waiting, Equipment n transmits the data of a control program to the equipment n, and rewrites the control program of the program memory (S47).
[0105] And although rewriting of the control program of all equipments ended, if it judged whether it was no (S48) and has ended, processing will be ended, but if there is equipment which has not been settled yet, Equipment n will be changed into the equipment of a degree and return (S51) and the above-mentioned processing will be repeated to step 46.
[0106] According to this 3rd operation gestalt, by one in the image formation equipment group connected by the connection actuation means representing, receiving a new control program from the outside, and rewriting program memory, the control program of two or more of other image formation equipments can be replaced using the data of that control program, and dependability improvement of a communication link and reduction of communication link cost can be aimed at.
[0107]
[Effect of the Invention] Rewriting of the control program of each image formation equipment which constitutes a network system according to this invention as it came explained above can be performed easily and efficiently using a connection actuation means. Furthermore, in the case of the network system by the image formation equipment which has external means of communications, the control program of each image formation equipment can be rewritten much more efficiently using the external means of communications.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] About an image formation equipment network system, especially this invention has a connection actuation means, and relates to the image formation equipment network system which can share printing with two or more image formation equipments.

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PRIOR ART

[Description of the Prior Art] Although image formation equipments, such as a copying machine, facsimile apparatus, and a printer, are used abundantly, there are some to which two or more image formation equipments were connected through the network in these. There are some which can perform connection actuation with two or more image formation equipments in such an image formation equipment network system.
[0003] In case connection actuation copies 100 manuscripts of one sheet, it is the function in which carrying out the exchange of other image formation equipments and information, and printing every 50 per set with two image formation equipments etc. shares an activity, and the image formation equipment which was able to give the activity shortens working hours.
[0004] It has the control program rewriting means by a memory card etc., respectively, and in case a control program is rewritten, the operator is usually carrying out to each image formation equipment in such an image formation equipment network system using the control program rewriting means for every image formation equipment.
[0005] Moreover, although the system which has the exterior and the external means of communications which communicates also has image formation equipment which constitutes an image formation equipment network system in this way through communication lines, such as a public line, the main functions of the external means of communications in that case are functions to tell the situation of failure or equipment to management equipments, such as a service center.

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EFFECT OF THE INVENTION

[Effect of the Invention] Rewriting of the control program of each image formation equipment which constitutes a network system according to this invention as it came explained above can be performed easily and efficiently using a connection actuation means. Furthermore, in the case of the network system by the image formation equipment which has external means of communications, the control program of each image formation equipment can be rewritten much more efficiently using the external means of communications.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] Since the operator had to do the rewriting activity by handicraft to each image formation equipment using a control program rewriting means by which it is attached at a time to one set as mentioned above when rewriting the control program of each image formation equipment in such an image formation equipment network system, serious time and effort and time amount had been required. This invention aims at enabling it to perform easily and efficiently rewriting of the control program of each image formation equipment which constitutes a network system in view of such a problem using a connection actuation means.
[0007] Furthermore, in the case of the network system by the image formation equipment which has the above external means of communications, it aims at enabling it to rewrite the control program of each image formation equipment much more efficiently using the external means of communications.
[0008]

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MEANS

[Means for Solving the Problem] In order that this invention may attain the above-mentioned purpose, two or more image formation equipments which have a means to read a manuscript, and a means to print the image read by this means are connected through a network. A connection actuation means to transmit and print the image information read by one set of the arbitration of the two or more image formation equipments to different image formation equipment, In the image formation equipment network system which has a means to choose independent actuation or connection actuation The control program rewriting means which transmits the control program of one image formation equipment of arbitration to other image formation equipments using the above-mentioned connection actuation means, and rewrites the control program is established.
[0009] Furthermore, it is good to make it have a means by which the above-mentioned control program rewriting means rewrites to coincidence the program of all the image formation equipments connected by the above-mentioned connection actuation means. Moreover, only when image formation actuation is completed or image formation actuation is omitted, as for image formation equipment besides the above, it is desirable to make it have a means to permit rewriting of the control program which led the connection actuation means.
[0010] When the image formation equipment of the above-mentioned network system has the exterior and the external means of communications which communicates through communication lines, such as a public line, one external means of communications of two or more image formation equipments which constitute a network system can receive the control program of equipment from the exterior, and the control program rewriting means which rewrites the control program of two or more image formation equipments using the above-mentioned connection actuation means can be established.
[0011] In that case, the image formation equipment which receives a control program from the exterior is good to consider as the image formation equipment which omits image formation actuation. Moreover, as for rewriting of the control program by the above-mentioned control program rewriting means, it is desirable to carry out, when image formation actuation of target image formation equipment is completed or image formation actuation is omitted.
[0012]
[Embodiment of the Invention] Hereafter, the gestalt of implementation of this invention is explained using a drawing. The copying machine system which is 1 operation gestalt of the image formation equipment which constitutes the image formation equipment network system by this invention in drawing 2 is shown. This copying machine system carried the automatic manuscript feed gear (it is called "ADF" for short below) 2 in the upper part of the body 1 of a copying machine, and has connected to a flank the finisher 100 who is after-treatment equipment. The near-side top face of the body 1 of a copying machine is equipped with the actuation display 30 shown in drawing 3 .
[0013] First, the usual copy actuation by this copying machine system is explained. As for the manuscript bundle put on the manuscript base 20 of ADF2 by turning the image side of a manuscript up, a push on the print key 34 on the actuation display 30 (start key) feeds the position on contact glass 6 with the bottom manuscript with the feed roller 3 and the feed belt 4.

[0014] After reading the image data of the manuscript on contact glass 6 by the reading unit 50, the manuscript which the reading ended is discharged by the top face of ADF2 with the feed belt 4 and a discharge roller 5. Furthermore, when it is detected by the manuscript set detection sensor 7 that the following manuscript is on the manuscript base 20, it is fed with the following manuscript on contact glass 6 like ****. The feed roller 3, the feed belt 4, and a discharge roller 5 are driven by the common motor which is not illustrated.
[0015] Paper is respectively fed to the transfer paper loaded into the 1st tray 8 within the body 1 of a copying machine, the 2nd tray 9, and the 3rd tray 10 by the 1st feeding unit 11, the 2nd feeding unit 12, and the 3rd feeding unit 13, and it is conveyed to the location which contacts a photo conductor 15 by the vertical conveyance unit 14.
[0016] The image data read by the reading unit 50 is written in a photo conductor 15 by the laser beam from the write-in unit 57, and a toner image is formed by passing the development unit 27. And while a transfer paper is conveyed with the conveyance belt 16 at rotation of a photo conductor 15 and uniform velocity, the toner image on a photo conductor 15 is imprinted. Then, an image is established in the fixing unit 17 and it is discharged by the finisher 100 of after-treatment equipment by the delivery unit 18.
[0017] A finisher 100 can usually lead the transfer paper conveyed with the delivery roller 19 of the body 1 of a copying machine in the direction of the delivery roller 102, and the direction of the staple processing section. By changing the change plate 101 upwards, it can convey on the staple base 108 via the conveyance roller 105,107. Whenever paper is delivered to one sheet, a paper end side is arranged by the jogger 109 for ******, and the transfer paper loaded into the staple base 108 is filed by the stapler 106 with a part of completion of a copy. The transfer paper group filed with the stapler 106 falls on the staple completion paper output tray 110, and is contained by self-weight there.
[0018] on the other hand, the usual paper output tray 104 is ******** in simple about the copy paper which moves forward and backward for every copy section by which is a movable paper output tray and sorting was carried out to the cross direction (direction perpendicular to the space of drawing 2) with every manuscript and the image memory, and is discharged with the delivery roller 103.
[0019] It once stocks to the double-sided feeding unit 111 by setting the branching pawl 112 for a path change to the bottom without leading the transfer paper which paper was fed to while from each medium trays 8-10, and was formed by the field to a paper output tray 104 side, when forming an image to both sides of a transfer paper.
[0020] Then, in order that the transfer paper stocked by the double-sided feeding unit 111 may imprint the toner image again formed by the photo conductor 15, paper is re-fed from the double-sided feeding unit 111, and an image is imprinted by the field of another side. The branching pawl 112 is set to the bottom at this time, and the transfer paper with which the image was formed in both sides is led to a paper output tray 104. Thus, when creating an image in both sides of a transfer paper, the double-sided feeding unit 111 is used.
[0021] A photo conductor 15, the conveyance belt 16, the fixing unit 17, the delivery unit 18, and the development unit 27 are driven by the Maine motor which is not illustrated, and the driving force of the Maine motor transmits and drives each feed units 11-13 with a feed clutch respectively. The driving force of the Maine motor transmits and drives the vertical conveyance unit 14 through a middle clutch.
[0022] Drawing 3 is drawing showing the layout of the actuation display 30 prepared in the body 1 of a copying machine of this copying machine system. The liquid crystal touch panel 31, a ten key 32, the clearance/stop key 33, the print key 34, the mode clear key 35, and the initialization key 36 are shown in this actuation display 30, and information, a key, etc. for the message which shows the condition of various function keys, and a number of copies and this copying machine system, and the control program rewriting actuation by this invention are displayed on the liquid crystal touch panel 31.
[0023] Drawing 1 is drawing showing the example of a display of the liquid crystal touch panel 31 of this actuation display 30. When an operator touches the key displayed on the liquid crystal

touch panel 31, the key which shows the selected function is reversed black. Moreover, when the detail of a function must be specified (for example, if it is variable power variable power value etc.), the setting screen of a detail function is displayed by touching the key. Thus, since the dot drop is being used for the liquid crystal touch panel 31, it can perform the optimal display at that time graphically.

[0024] In the example of a display shown in drawing 1 , the message area which displays the message of "it can copy", and "waiting" etc. is established in the upper left, a double key, such as specifying the scale factor of the copy number-of-sheets display which displays the set number of sheets, the automatic concentration key which adjusts image concentration automatically to the bottom of it, the automatic form selection key which chooses a transfer paper automatically, and actual size, is located in a line, and the right is displayed.

[0025] furthermore, the 2nd step from the bottom -- right-hand side to a copy -- a part -- every -- a page -- order -- the key which specifies when performing the sort key which specifies the processing to arrange, the stack key which specifies the processing which classifies a copy for every page, the staple key which specify the processing which files a part of thing by which sorting application was carried out every, and the control program rewriting actuation concerning this invention is displayed side by side.

[0026] And the printing key which sets up printing of the intensive key, stamp and date for setting up both sides/split key, and intensive copy mode which set up the variable power key, double-sided mode, or division mode which sets expansion/reduction percentage to the bottom from right-hand side, a page, etc. is displayed. In addition, as for the mode specified, a half-tone-dot-meshing indication of the key is given. Moreover, processing when a program rewriting actuation key is specified is explained to a detail later on.

[0027] Actuation until it carries out latent-image formation of image reading and the image by this copying machine system on a photo conductor side here using drawing 2 again is explained. A latent image is potential distribution which produces an image by changing and irradiating optical information on a photo conductor side.

[0028] The reading unit 50 is constituted by the contact glass 6 and the optical scan system which lay a manuscript, and is constituted from the exposure lamp 51, the 1st mirror 52, the 2nd mirror 55, the 3rd mirror 56, a lens 53, and CCD series 54 grade by the optical scan system. The exposure lamp 51 and the 1st mirror 52 are fixed on the 1st carriage which is not illustrated, and the 2nd mirror 55 and the 3rd mirror 56 are being fixed on the 2nd carriage which is not illustrated.

[0029] When reading a manuscript image, the 1st carriage and the 2nd carriage are mechanically scanned with the relative velocity of 2 to 1 so that the optical path length may not change. This optical scan system is driven by the scanner motor which is not illustrated. A manuscript image is read by CCD series 54, is changed into an electrical signal and processed. An image scale factor changes by moving a lens 53 and CCD series 54 to a longitudinal direction in drawing 1 . That is, corresponding to the specified scale factor, a location is set as the longitudinal direction of a lens 53 and CCD series 54.

[0030] The write-in unit 57 consisted of a laser output unit 58, an image formation lens 59, and a mirror 60, and equips the interior of the laser output unit 58 with the rotating polygon (polygon mirror) which carries out high-speed constant-speed rotation by the laser diode and motor which are a laser light source. The laser beam irradiated from the laser output unit 58 is deflected by the polygon mirror which carries out constant-speed rotation, passes along the image formation lens 59, is turned up by the mirror 60, and carries out condensing image formation on the front face of a photo conductor 15.

[0031] An exposure scan is carried out in the direction which a photo conductor 15 rotates, and the direction (main scanning direction) which intersects perpendicularly, and the deflected laser beam records the Rhine unit of the picture signal outputted from the selector 64 of the image-processing section shown in drawing 9 mentioned later. By repeating horizontal scanning with the predetermined period corresponding to the rotational speed and recording density of a photo conductor 15, an image (electrostatic latent image) is formed on the front face of a photo conductor 15.

[0032] As mentioned above, the laser beam outputted from the laser output unit 58 of the write-in unit 57 is irradiated by the photo conductor 15 of an image imaging system. Although not illustrated in the location where the laser beam near the end of a photo conductor 15 is irradiated, the beam sensor which generates a horizontal-scanning synchronizing signal is arranged. The control signal for outputting and inputting the picture signal which the image recording initiation timing of a main scanning direction controls and mentions later based on the horizontal-scanning synchronizing signal generated by the beam sensor is generated.
[0033] Next, the configuration of the image-processing section (image reading section and image write-in section) in this copying machine system is explained using drawing 4 . The light emitted from the exposure lamp 51 shown in drawing 2 irradiates a manuscript side, carries out image formation of the reflected light from a manuscript side with a lens 53, receives light and carries out photo electric conversion with CCD series 54, by A/D converter 61, is changed into the digital signal of binary or a multiple value, and is quantized. After a shading compensation is made by the shading compensation section 62, as for the picture signal changed into the digital signal, image amendment of MTF amendment, gamma amendment, etc. is made by the MTF-gamma amendment section 63.
[0034] In addition, a shading compensation is amending the variation in the exposure nonuniformity of the light source which irradiates a manuscript, and the sensibility of CCD series. MTF amendment is amending dotage by optical system, and gamma amendment is amending the nonlinearity of the sensibility of CCD series.
[0035] In a selector 64, the change which uses the destination of a picture signal as the variable power section 71 or the memory controller 65 is performed. According to the rate of variable power, enlarging or contracting of the picture signal which went via the variable power section 71 is carried out, and it is sent to the write-in unit 57. It has composition which can output and input a picture signal bidirectionally between the memory controller 65 and the selector 64.
[0036] The two printing composition sections 72 and 73 are formed in this image-processing section (IPU) so that the printing data generated by the printing image-data generator (printing unit) 74 based on the image data (for example, data outputted from data processors, such as a personal computer) supplied from the outside besides the image data which was shown in drawing 2 , and which reads and is inputted from a unit 50 can also be processed.
[0037] This image-processing section is equipped with I/O Port 75 which serves as data with ROM69 and RAM70 which store CPU68 which performs setup to the memory controller 65 etc., and control of the reading unit 50 and the write-in unit 57, and its program and data, and the exterior, and an interface of the address further, and the SCSI (Small computer system interface) driver 76. This CPU68 can perform writing and read-out of the data of an image memory 66 through the memory controller 65.
[0038] In addition, although illustration is omitted, this copying machine system is equipped also with the communications control circuit which is the external means of communications which connects with a public line etc. and communicates with the exterior.
[0039] Here, the picture signal for 1 page in the selector 64 of drawing 4 is explained using drawing 5 . In drawing 5 , a frame gate signal / FGATE expresses the shelf-life of the direction of vertical scanning of 1-page image data. A horizontal-scanning synchronizing signal / LSYNC is the horizontal-scanning synchronizing signals in every line, is the predetermined clock after this signal falls, and becomes effective [a picture signal]. The signals which show that the picture signal of a main scanning direction is effective are a line gate signal / LGATE.
[0040] These signals synchronize with pixel clock signal VCLK, and 1-pixel data are sent to one period of VCLK. This image-processing section has the generating means of separate frame gate signal / FGATE, a horizontal-scanning synchronizing signal / LSYNC, a line gate signal / LGATE, and pixel clock signal VCLK to an image input and each output, and the combination of various image I/O becomes realizable.
[0041] The detail of the memory controller 65 in drawing 4 and an image memory 66 is explained using drawing 6 . The memory controller 65 has the input data selector 81, 82 or primary image composition section compression / expanding section 83, and 84 or secondary output data selector compression / expanding section 85. A setup of the control data to these each part is

performed by CPU68 shown in drawing 4 . The address and data in drawing 6 show image data, and the address of the data connected to CPU68 is not illustrated.
[0042] An image memory 66 consists of the primary secondary storage 86 and 87. Primary storage 86 uses the memory in which rapid access, such as DRAM, is possible so that an abbreviation synchronization may be carried out and data read-out from the data writing to memory or the memory at the time of an image output can carry out to an input image data transfer rate at a high speed.
[0043] Moreover, the magnitude of the image data which processes divided primary storage 86 into two or more area, and it has taken the configuration (interface section with a memory controller) which can be performed to coincidence for I/O of image data. In order to enable activation of an image entry of data and an output to juxtaposition respectively in the divided each area, 2 sets of address data lines, the object for a lead and the object for lights, are connected to the interface with the memory controller 65. Thereby, while inputting an image into a certain area (light), actuation of outputting an image from other area (lead) is attained.
[0044] Secondary storage 87 is mass memory which saves data, in order to perform composition and sorting of the inputted image. If primary storage 86 and secondary storage 87 use the memory device in which rapid access is possible, it has the primary composition [secondary] of using a cheap mass record medium and performing processing of a I / O data through primary storage although data can be processed fair, control also becomes comparatively easy and an access rate is not so quick to secondary storage 87 since components, such as DRAM, are expensive.
[0045] By adopting the configuration of the above image memory, it becomes possible to realize the image formation equipment which can process I/O of a lot of image data, preservation, processing, etc. with a comparatively easy cheap and configuration.
[0046] Next, the outline of actuation of this memory controller 65 is explained. First, an image input (preservation to an image memory) is explained. The input data selector 81 chooses the image data which performs the writing to the primary storage [from] 86 of an image memory 66 among two or more data.
[0047] The image data chosen by the input data selector 81 is supplied to the image composition section 82, and performs composition with the data already saved in the image memory 66. The image data processed by the image composition section 82 compresses data by primary compression / expanding section 83, and writes the data after the compression in primary storage 86. After the data written in primary storage 86 compress further in secondary compression / expanding section 85 if needed, they are saved at secondary storage 87.
[0048] At the time of an image output, the image data memorized by primary storage 86 is read. When the image used as the candidate for an output is stored in primary storage 86, the image data read from primary storage 86 is elongated in primary compression / expanding section 83, and the image data after the expanding or the image data after performing image composition with the image data after expanding and input image data is chosen and outputted by the output data selector 84.
[0049] The image composition section 82 processes selection (dual output to the output destination change of both write back to an image output and primary storage 86) of the output destination change of composition (it has the phase-adjustment function of image data) with the image data read from primary storage 86, and input image data, and the image data after composition etc.
[0050] When the image data used as the candidate for an output is not stored in primary storage 86, after reading the image data for an output stored in secondary storage 87, elongating in secondary compression / expanding section 85 and writing the image data after the expanding in primary storage 86, the same image output actuation as having mentioned above is performed.
[0051] Although copy actuation cannot be started in this system at the times under heating of the fixing unit which showed "reservation of operation" to drawing 2 in PPC (plain paper copier) etc., when the copy actuation of a fixing unit is attained after heating termination, it is the thing of the function automatically started in copy actuation by terminating mode setting and the present set and reserving.

[0052] With this operation gestalt, although under heating of a fixing unit is set as the object which can be reserved [of operation], about the thing whose actuation is attained with the passage of time besides this, it can be made an object. Under the toner supply actuation to the rise time of the medium tray in extensive feeding equipment, time amount until rotation of the polygon motor in write-in equipment is stabilized, and a development unit etc. can be considered.

[0053] Drawing 7 and drawing 8 are the hard block diagrams of other image formation equipments which carry out this invention. These image formation equipments consist of the image reading section A, the image write-in section B, a system controller C, the memory unit D, the user limiter machine E, the body detection sensor F, a control unit (it is the same as an actuation display) G, remote diagnostic equipment (CSS) H, and a clock I. However, the memory unit D is required only when realizing a memory function, and only considering realizing the usual copy function, it is not required.
[0054] Furthermore, if Clock I becomes a certain specific time amount, only when booting equipment or realizing weekly timer ability [shut / ability], it is required. Moreover, the body detection sensor F is required, only when the user has approached before this equipment at the time of preheating mode and it realizes the function to cancel preheating mode automatically, and since the remote diagnostic equipment (CSS) H is a function which carries out a monitor from the telediagnosis, i.e., a remote place, it should be equipped with it only when such a function is required. However, even when not preparing this, it is necessary to prepare the communications control circuit for communicating with the exterior.
[0055] A system controller C is the generic name of the controller which controls scanner actuation, ON/OFF of the light source, etc., in order to supervise paper conveyance processing, electrophotography process processing, an abnormal condition, a sheet paper cassette condition, etc. in order to carry out image formation in the image write-in section B (detection of the existence of a form etc.) and to read the image of a manuscript in the image reading section A, when performing copy mode.
[0056] It is changing and reading an image into an electrical signal and restoring an electrical signal to the big description of a digital plain paper copier (plain paper copier) in the image write-in section (this also being called image formation equipment). At this time, it can apply now to the field which was not able to be realized by the conventional analog PPC by having a means to change the electrical signal of the read image variously and to transmit it.
[0057] For example, functions, such as FAX, a page printer, a scanner, and a file system, are realizable, and also, recently, performing the print of two or more sheets with one scan, or printing the image of two or more manuscripts on the transfer paper of one sheet is realized by once storing the image data read at the time of activation of a PPC function in stores, such as DRAM, and reading the pixel data if needed. These functions that can carry out digital-plain-paper-copier system no one but implementation are expressed as "extension" or an "application."
[0058] Furthermore, it not only carries one extension, but in the latest digital plain paper copier, it has come to carry two or more applications in coincidence. Thus, the digital plain paper copier which shares one resource is expressed as a "system", and the controller which controls this system is also called a "system controller."
[0059] A preheating is the mode in which power consumption is saved, by constant-temperature (for example, 10 degrees C)-lowering fixing temperature, controlling it, and erasing the display of a control unit G. A setup in this mode is automatically made after fixed time amount progress, after actuation and actuation are lost depending on the key input by the control unit G, and a setup. Discharge in this mode is canceled when it detects the key input by the control unit G, and that people stood in front of equipment by the body detection sensor F depending on the setup.
[0060] The DRAM block in the memory unit D in drawing 7 and drawing 8 is for memorizing the picture signal read in the image reading section A, according to the demand from a system controller C, is saved in the image write-in section B, and can transmit ******** image data.
[0061] The compressed block in the memory unit D possesses compression functions, such as

MH, MR, and a MMR method, the once read image was compressed, and it has prepared them in order to aim at improvement in the utilization ratio of memory (DRAM). Moreover, rotation of an image is realizable by changing the read-out address and its direction of [from the image write-in section B].

[0062] The user limiter machine E is formed in order to specify limit a user since PPC which is using the electrophotography process has much consumption of an article of consumption, or to manage the use number of sheets of a transfer paper for every user and every use post of its, and it has what uses a "coin rack", a "key counter", a "keycard", a "prepaid card", etc., the thing which uses a password code.

[0063] The hard configuration of drawing 7 is performing control of the image reading section A, the image write-in section B, the memory unit D, and the remote diagnostic equipment H only by CPU in a system controller C. He gives CPU to the image reading section A, the image write-in section B, and the memory unit D, respectively, and is trying to, transmit the command from a system controller C to CPU of each part by the control signal line with the hard configuration of drawing 8 on the other hand. Thus, the hard configuration of the image formation system which carries out this invention can be performed freely.

[0064] Drawing 9 shows the example of the image formation device-management structure of a system which used remote diagnostic equipment (CSS). The network system by the management equipment Q currently installed in the service base and two or more image formation equipments P, such as PPC currently installed in a user's origin, is connected through the public line network N. Communication link control apparatus R for controlling the communication link with management equipment Q is installed in the user side, and each image formation equipment P of user origin is connected to this communication link control apparatus R.

[0065] Connection of Telephone TEL and facsimile apparatus FAX is attained at communication link control apparatus R, and installation is possible in the form inserted in a user's existing circuit. Although two or more image formation equipments P are connectable at communication link control apparatus R, of course, there may be an unit. These image formation equipments P do not need to be the things of isomorphism, and a different model is sufficient as them. Furthermore, things other than PPC may be used.

[0066] Here, it is made [that a maximum of five image formation equipments P are connectable and] one set [after / expedient / explaining / of a communication link control apparatus] R. Multidrop connection of communication link control apparatus R and two or more image formation equipments P is made by the RS-85 plan.

[0067] Communications control between communication link control apparatus R and each image formation equipment P is performed by the basic mode data transmission control means. By establishing a data link with the polling/selecting of the Sentra RAIZUDO control which made communication link control apparatus R the control station, the communication link with the image formation equipment of arbitration is attained. Each image formation equipment P can set up the discernment value of a proper now with an address selection switch, and the polling address of each image formation equipment P and the selecting address are determined by this.

[0068] While the image formation equipment P which carried out control program transmission from management equipment Q at image formation equipment P, and received it rewrites a self control program using this image formation device-management system, it is possible to also rewrite the control program of other image formation equipments P using the connection actuation means between each image formation equipment.

[0069] Drawing 10 shows the example of a system configuration of the network copy which is an example of an image formation equipment network system which carries out this invention. Although eight digital copiers are connected and connected by network by the network interface in this drawing, the number of the copying machine naturally connected does not need to limit. It is connectable with a public line network through a communication link control apparatus like the case of the image formation device-management system which showed this network to drawing 9 .

[0070] Next, the example of a hard configuration for realizing this invention is further explained using drawing 11 . Each digital plain paper copier shown in this drawing 11 - The hard

configuration of I and II has taken the same configuration as a thing and abbreviation shown in drawing 7 , attaches the same sign of each part of drawing 7 , and that explanation is omitted. However, into the memory unit D of each digital plain paper copier, since the read image is transmitted on an external network or the image data from a network is saved in the DRAM block section in a memory unit, the SCSI controller was formed, respectively and it has been connected by SCSI as a network means.

[0071] For a network communication means, various means, such as using the TCP/IP communication link of an OSI reference model for data communication, can be considered, using Ethernet as a physical means with a natural thing. Moreover, the transfer of control command like a remote output command, a setting command, etc. which the condition of each PPC which exists on a network inside the plane notifies or mentions later can also be performed not to mention an image data transfer as mentioned above by using a configuration like drawing 11 .

[0072] Next, it is a digital plain paper copier about the image read in the image reading section A of digital-plain-paper-copier-I of this drawing 11 . - The connection actuation (remote output) transmitted to the image write-in section B of II is explained. Drawing 12 is the conceptual diagram of the software. "copy shown in drawing 12 -- an application -- " -- the application which performs the copy sequence for performing copy actuation, and "input/output control" are Rhea (device driver) who does logic / physical conversion of the data.

[0073] A control unit controller is Rhea (Rhea who performs a LCD display, LED lighting / putting out lights, a key input scan, etc. with logical level) who performs MMI (Man Machine Interface), and a "circumference machine controller" is Rhea who performs control of the circumference machine with which PPC, such as an automatic double-sided unit, and a sorter, ADF, is equipped with logical level. An "image formation equipment controller", a "image reader controller", and a "memory unit" are as above-mentioned.

[0074] Moreover, the "daemon process" exists in image data read-out saved in the memory unit, and "image formation equipment" as application which performs the duty which transmits image data, when a print request is requested from other equipments on a network. Before a "daemon process's" reading image data from a memory unit with a natural thing and performing print actuation, the image transfer from other equipments on a network must be ended.

[0075] A control unit, a circumference machine, image formation equipment, an image reader, and a memory unit are treated here as a resource (resource) which each PPC holds. When "digital-plain-paper-copier-I" of drawing 11 performs copy actuation using each own resource (at the time of a print start key depression), each resource of a "circumference machine" and a "memory unit" is required from the "system controller" which performs system control "image formation equipment", a "image reader", or if needed.

[0076] a "system controller" -- "copy -- an application -- " -- from -- a demand -- receiving -- mediation of the royalty of a resource -- carrying out -- "copy -- an application -- " -- the mediation result (use propriety) is notified. all the resources that a system holds when "digital-plain-paper-copier-I" is used by the stand-alone (condition by which network connection is not carried out) -- all -- "copy -- an application -- " -- since it is in the condition which can be occupied, copy actuation is performed immediately.

[0077] In performing actuation with a pudding using the resource of another digital plain paper copier (henceforth a "remote digital plain paper copier") which exists on a network like this operation gestalt on the other hand, it requires the royalty of a resource from the "system control section" of a remote digital plain paper copier.

[0078] the "system controller" of a remote digital plain paper copier -- a demand -- following -- mediation of a resource -- carrying out -- "copy of the digital plain paper copier of the result demand-origin -- an application -- " -- it notifies. that "copy -- an application -- " -- when a royalty is permitted, after performing reading of an image and completing image storage into an own memory unit, an image transfer is performed to the memory unit of the digital plain paper copier of the remote output point through an external interface (this example SCSI).

[0079] After an image transfer is completed and transmitting the monograph affairs (feed opening, delivery opening, print number of sheets, etc.) for performing a print to the "daemon process" of the digital plain paper copier of the remote output point, a "print initiation"

command is transmitted. If the "daemon process" of the remote output point receives a "print initiation" command, print initiation will be required from own (digital plain paper copier which performs a remote output) a "system controller", and a remote output will be performed by the "system controller."
[0080] when the memory unit of "digital-plain-paper-copier-II" is used by "digital-plain-paper-copier-I", in the memory unit of "digital-plain-paper-copier-II", use of the application of "digital-plain-paper-copier-II" (or the case where two or more digital plain papers copier are connected on a network as shown in drawing 10 -- digital plain papers copier other than "digital-plain-paper-copier-I") is improper.
[0081] The function hereafter made into a control program rewriting means, i.e., the description of this invention, to rewrite a control program using a connection actuation means, in each image formation equipment mentioned above with reference to the flow chart of drawing 13 - drawing 15 is explained. This function is made by the network interface indicated to be the system control section (system controller) shown in drawing 7 , the system controller C shown in 8 and 11, or drawing 12 to drawing 10 , drawing 11 , and drawing 12 .
[0082] First, the 1st operation gestalt of this invention is explained using the flow chart of drawing 13 . This 1st operation gestalt functions as image formation equipment which each image formation equipment which constitutes a network system can connection operate [usual] usually. In addition, in each future flow chart, the "step" is written as "S." First, the flow chart shown in (a) of drawing 13 explains how to rewrite the control program of one image formation equipment manually. There are not the control program rewriting approach of the former [approach / this / itself] and a place where it changes.
[0083] If the image formation equipment which rewrites a control program is used as Equipment A, the power source of the equipment A will be turned OFF first (S1), and the ROM card with which the new control program rewritten in the predetermined location (slot) of the equipment A was recorded will be inserted (S2). Next, if it is made the power source ON of the equipment A (S3), a program rewriting actuation key will be displayed on the liquid crystal touch panel 31 shown in drawing 1 of the actuation display 30 shown in drawing 3 , and it will wait for the rewriting initiation by the touch (S4). Processing is ended, when it rewrites in predetermined time and initiation is not directed.
[0084] If it rewrites here and initiation is directed, will perform a control-panel lock (S5), it will be made not to receive the actuation input except being related with program rewriting by the actuation display 30 shown in drawing 3 after it till activity termination, the control program of a ROM card will be read, and the rewriting actuation of the control program currently written in the program memory within a body will be started (S6). This termination reboots Equipment A, applying body reset (S7).
[0085] Next, the flow chart shown in (b) of drawing 13 explains how to rewrite the control program of other image formation equipments (it considers as Equipment B) which are not rewritten yet using the connection actuation means from the equipment A in the condition that there is image formation equipment (the above-mentioned equipment A) already rewritten by the new control program.
[0086] First, by the actuation display 30 of Equipment B, the program transfer item in serviceman setting mode is chosen (S8), and the machine number of the equipment A which rewrote the control program is inputted (S9). A control-panel lock is performed after it (S10), and it indicates that it is [data] under reception to the actuation display 30, and is made not to receive an actuation input till activity termination. And after rewriting the control program which receives a control program and is written in the program memory within a body from Equipment A (S11) and completing this, Equipment B is rebooted, applying body reset (S12).
[0087] In this operation gestalt, Equipment B does not need to have a program rewriting means in the hand control by a flash ROM etc. Therefore, that what is necessary is just to have a program rewriting means in hand control, the image formation equipment of either of the image formation equipment network systems can use the rewriting means of the program effective also in rewriting of the control program of other image formation equipments, can make equipment of unnecessary hardware unnecessary, and can reduce cost.

[0088] Below, the flow chart of drawing 14 is used and the 2nd operation gestalt of this invention is explained. (a) of drawing 14 shows actuation of the equipment A which is image formation equipment of a control program transmitting side, and (b) shows actuation of the image formation equipment boiled a control program reception side. Also in this 2nd operation gestalt, each image formation equipment which constitutes a network system functions usually as image formation equipment in which the usual connection actuation is possible.
[0089] First, the actuation by the side of the equipment A which is image formation equipment equipped with the program rewriting means carries out a selection setup of all the device control program rewriting activation items in serviceman setting mode from the actuation display 30, as shown in the flow chart of (a) of drawing 14 (S21). The control panel of an actuation display is locked and it is made not to receive actuation of a user by that cause (S22).
[0090] Subsequently, the current condition of all the image formation equipments connected with the connection actuation means is checked in the small order of the equipment item number of an equipment proper (S23). A program version removes for program rewriting about the same equipment as Equipment A in that case. And if the existence of the equipment of a power-source OFF condition is checked (S24) and there is equipment of a power-source OFF condition, the message which demands the power source ON of the equipment will be displayed on a control panel (S25). If there is no equipment of a power-source OFF condition, it will progress to step 26 as it is.
[0091] And it is judged as the candidate for rewriting, and rewrites to all equipments, a demand is transmitted (S26), and a control program is transmitted to all equipments after that (S27). However, when the equipment of the other party which transmitted the rewriting demand is image formation operating, it waits to end the image formation actuation and to be in a standby condition, and a control program is transmitted.
[0092] therefore -- the case where it judges whether the equipment of a receiving side has the waiting condition of the present equipment if a rewriting demand signal is received as shown in the flow chart of (b) of drawing 14 (S30) (S31), and it is in a standby condition -- immediately -- equipment A -- receiving -- a rewritable response -- transmitting (S32) -- in not being in a standby condition, it rewrites, after waiting until it will be in a standby condition, and transmits a response.
[0093] By it, the equipment A side mentioned above transmits control program data to the equipment at the order which received the rewritable response (S27). Body reset is performed, after the equipment of a receiving side rewrites the control program currently written in the program memory within a body if a control program is received from Equipment A (S33) (S34) and it is completed (S35).
[0094] When it carries out about all the equipments that rewrote this actuation and were judged to be objects and the rewriting activity of a control program is completed with all equipments, a completion message is displayed on the actuation display of Equipment A, and all actuation is completed.
[0095] Since each of that control program is once rewritable by actuation to all the image formation equipments connected by the connection actuation means according to this operation gestalt, compaction of much more simplification of a control program rewriting activity and working hours can be aimed at. Moreover, a dependability improvement of a control program replacement activity can be aimed at by having enabled it to perform reception and rewriting actuation of a control program, only when image formation equipment was waiting.
[0096] Next, the 3rd operation gestalt of this invention is explained using the flow chart of drawing 15 , and the block diagram of drawing 16 . Like the image formation device-management system mentioned above by drawing 9 , in addition to the network system to the 2nd operation gestalt, this 3rd operation gestalt prepares one communication link control apparatus R, as shown in drawing 16 , and it connects it with external communication device 122,122' prepared in each image formation equipment P which constitutes a network system, and P' through serial interface 131,131.
[0097] Image formation equipment P and P' control external communication-interface 132,132' with external communication device 122,122', and the connection interface 133 with other image

formation equipments by the system controller C and C'. Communication link control apparatus R is connected with the service center (management equipment) Q through the public line N. Moreover, the connection interface 133 is superior to external communication-interface 132,132' or serial interface 131 in dependability or transmission speed.

[0098] In this image formation equipment network system, image formation equipment P and P' can receive the information from the outside that it was inputted through communication link control apparatus R, through the external communication device 122 or 122'. On the contrary, image formation equipment P or the information from P' lets the external communication device 122 or 122', and communication link control apparatus R pass, and is transmitted to the external service center Q.

[0099] Moreover, image formation equipment P performs image formation equipment P' and a communication link using the connection interface 133, the communication link of it is possible with the exterior through external communication device 122', image formation equipment P' can also perform a communication link with image formation equipment P using the connection interface 133, and it can communicate with the exterior through the external communication device 122. In addition, although this example shows the case where the network is formed by two image formation equipments, of course, the number of image formation equipment is not limited to two sets.

[0100] The flow chart of drawing 15 explains control program rewriting actuation of the image formation equipment by this 3rd operation gestalt. Each image formation equipment P which constitutes a network system also from this 3rd operation gestalt, and P' function usually as image formation equipment in which the usual connection actuation is possible.

[0101] If the existence of the equipment under current standby is judged in image formation equipment P with external means of communications, and P' (S41) and there is no waiting equipment when communication link control apparatus R receives a program transfer request from a service center Q, it will rewrite to a service center Q and an improper response will be returned (S49). If there is waiting equipment, the rewritable response of the equipment (image-formation equipment P or P': consider as Equipment A) will be returned to a service center Q (S42).

[0102] And while displaying that it is [program] under rewriting on the control panel of the equipment A, user actuation invalid processing is carried out, and it is made not to receive actuation of a user (S43).

[0103] Then, the data of the control program for rewriting to receive are transmitted to Equipment A through the external communication device 122 or 122' from a service center Q (S44). The equipment A which received the control program writes the control program in un-volatilizing [which is program memory / ROM], and resets a body (S45). Rewriting of the control program of Equipment A is completed by this.

[0104] Next, the control program of this equipment A and other equipments n which can be communicated is rewritten one by one. First, it confirms whether the first equipment n is waiting (S46), and n will be changed into the number of the equipment of a degree if not waiting (S50). When waiting, Equipment n transmits the data of a control program to the equipment n, and rewrites the control program of the program memory (S47).

[0105] And although rewriting of the control program of all equipments ended, if it judged whether it was no (S48) and has ended, processing will be ended, but if there is equipment which has not been settled yet, Equipment n will be changed into the equipment of a degree and return (S51) and the above-mentioned processing will be repeated to step 46.

[0106] According to this 3rd operation gestalt, by one in the image formation equipment group connected by the connection actuation means representing, receiving a new control program from the outside, and rewriting program memory, the control program of two or more of other image formation equipments can be replaced using the data of that control program, and dependability improvement of a communication link and reduction of communication link cost can be aimed at.

[Translation done.]

* NOTICES *

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1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is drawing showing the example of a display by the liquid crystal touch panel 31 of an actuation display shown in drawing 3 .
[Drawing 2] It is the typical sectional view of the copying machine system in which an example of the image formation equipment which constitutes the image formation equipment network system by this invention is shown.
[Drawing 3] It is the top view showing the layout of an actuation display prepared in the body 1 of a copying machine of the copying machine system shown in drawing 2 .
[Drawing 4] It is the block diagram showing the configuration of the image-processing section (image reading section and image write-in section) in the copying machine system shown in drawing 2 .
[Drawing 5] It is the wave form chart of the picture signal for 1 page in the selector 64 shown in drawing 4 .
[Drawing 6] It is the block diagram showing the memory controller 65 of the image-processing section and the configuration of an image memory 66 which were shown in drawing 4 .
[Drawing 7] It is the hard block diagram of other image formation equipments which carry out this invention.
[Drawing 8] It is the hard block diagram of the image formation equipment of others [pan / which carries out this invention].
[Drawing 9] Image formation device-management structure-of-a-system Fig. **** which can be used for carrying out this invention.
[Drawing 10] It is the system configuration Fig. of the network copy which can carry out this invention.
[Drawing 11] It is the structure-of-a-system Fig. which connected two sets of the digital plain papers copier which carry out this invention.
[Drawing 12] Similarly it is the conceptual diagram of the software.
[Drawing 13] It is the flow Fig. showing the control program rewriting actuation by the hand control in the 1st operation gestalt of this invention.
[Drawing 14] It is the flow Fig. showing the control program rewriting actuation by semi-automatic [in the 2nd operation gestalt of this invention].
[Drawing 15] It is the flow Fig. showing automatic control program rewriting actuation in which the 3rd operation gestalt of this invention can be set.
[Drawing 16] It is the block diagram showing the example of a configuration of the image formation equipment network system of the 3rd operation gestalt of this invention.
[Description of Notations]
1: Body of a copying machine 2: Automatic manuscript feed gear
3: Feed roller 4: Feed belt
5: Discharge roller 6: Contact glass
8: The 1st tray 9: The 2nd tray
10: The 3rd tray 11: The 1st feeding unit
12: The 2nd feeding unit 13: The 3rd feeding unit

14: Vertical conveyance unit 15: Photo conductor
16: Conveyance belt 17: Fixing unit
18: Delivery unit 20: Manuscript base
30: Actuation display 31: Liquid crystal touch panel
32: Ten key 33: A clearance/stop key
34: Print key 35: Mode clear key
36: Initialization key 50: Reading unit
57: Write-in unit 100: Finisher
65: Memory controller 66: Image memory
68:CPU 69:ROM 70:RAM
76: SCSI driver A: Image reading section
B: The image write-in section
C, C': System controller
D: Memory unit E: User limiter machine
F: Body detection sensor G: Control unit (actuation display)
H: Remote diagnostic equipment (CSS) I: Clock
P, P': Image formation equipment (PPC) Q: Management equipment
R: Communication link control apparatus N: Public line network

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[Translation done.]

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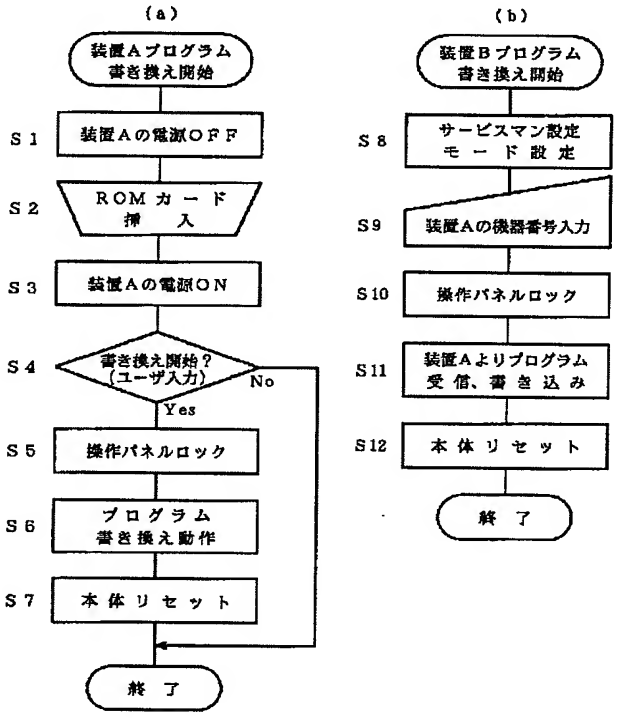
(54)【発明の名称】　画像形成装置ネットワークシステム

(57)【要約】

【課題】　ネットワークシステムを構成する各画像形成装置の制御プログラムの書き換えを、容易に且つ効率的に行なうことができるようにする。

【解決手段】　複数台の画像形成装置がネットワークを介して接続され、その複数台の画像形成装置のうちの任意の１台で読み取られた画像情報を異なる画像形成装置に転送して印刷する連結動作手段を有する画像形成装置ネットワークシステムにおいて、任意の１台の画像形成装置の制御プログラムを書き換えることにより、連結動作手段を用いてその制御プログラムを他の画像形成装置へ転送して他の各画像形成装置の制御プログラムを書き換える手段を設けた。



【特許請求の範囲】
【請求項１】　原稿を読み取る手段と、該手段によって読み取られた画像を印刷する手段とを有する複数台の画像形成装置がネットワークを介して接続され、その複数台の画像形成装置のうちの任意の１台で読み取られた画像情報を異なる画像形成装置に転送して印刷する連結動作手段と、単独動作か連結動作かを選択する手段とを有する画像形成装置ネットワークシステムにおいて、
前記連結動作手段を用いて任意の１台の画像形成装置の制御プログラムを他の画像形成装置へ転送してその制御プログラムを書き換える制御プログラム書換手段を設けたことを特徴とする画像形成装置ネットワークシステム。
【請求項２】　請求項１に記載の画像形成装置ネットワークシステムにおいて、
前記制御プログラム書換手段が、前記連結動作手段によって接続されたすべての画像形成装置のプログラムを同時に書き換える手段を有することを特徴とする画像形成装置ネットワークシステム。
【請求項３】　請求項２に記載の画像形成装置ネットワークシステムにおいて、
前記他の画像形成装置は、画像形成動作が終了したかあるいは画像形成動作を行なっていないときにのみ前記連結動作手段を通じた制御プログラムの書き換えを許可する手段を有することを特徴とする画像形成装置ネットワークシステム。
【請求項４】　原稿を読み取る手段と、該手段によって読み取られた画像を印刷する手段と、公衆回線等の通信回線を通して外部と通信する外部通信手段とを有する複数台の画像形成装置がネットワークを介して接続され、その複数台の画像形成装置のうちの任意の１台で読み取られた画像情報を異なる画像形成装置に転送して印刷する連結動作手段と、単独動作か連結動作かを選択する手段とを有する画像形成装置ネットワークシステムにおいて、
前記複数台の画像形成装置のいずれかの前記外部通信手段によって外部から装置の制御プログラムを受信し、前記連結動作手段を用いて複数台の画像形成装置の制御プログラムを書き換える制御プログラム書換手段を設けたことを特徴とする画像形成装置ネットワークシステム。
【請求項５】　請求項４に記載の画像形成装置ネットワークシステムにおいて、
外部から制御プログラムの受信を行なう画像形成装置は、画像形成動作を行っていない画像形成装置とすることを特徴とする画像形成装置ネットワークシステム。
【請求項６】　請求項４に記載の画像形成装置ネットワークシステムにおいて、
前記制御プログラム書換手段による制御プログラムの書き換えは、対象とする画像形成装置の画像形成動作が終了したかあるいは画像形成動作を行っていない時に行なうことを特徴とする画像形成装置ネットワークシステム。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】この発明は画像形成装置ネットワークシステムに関し、特に連結動作手段を有し、複数の画像形成装置で印刷を分担できる画像形成装置ネットワークシステムに関する。
【０００２】
【従来の技術】複写機、ファクシミリ装置、プリンタ等の画像形成装置が多用されているが、これらには複数の画像形成装置をネットワークを介して接続されたものがある。このような画像形成装置ネットワークシステムには、複数の画像形成装置によって連結動作を行うことができるものがある。
【０００３】連結動作とは、たとえば１枚の原稿を１００枚複写する際、作業を与えられた画像形成装置が他の画像形成装置と情報のやり取りをして、２台の画像形成装置で１台あたり５０枚ずつ印刷を行なうなど、作業を分担して作業時間を短縮するような機能である。
【０００４】このような画像形成装置ネットワークシステムにおける各画像形成装置には、通常、メモリカード等による制御プログラム書き換え手段をそれぞれ有しており、制御プログラムを書き換える際には、作業者が各画像形成装置ごとにその制御プログラム書き換え手段を用いて行なっている。
【０００５】また、このように画像形成装置ネットワークシステムを構成する画像形成装置が、公衆回線等の通信回線を通して外部と通信する外部通信手段とを有するシステムもあるが、その場合の外部通信手段の主な機能は、故障や装置の状況をサービスセンタなどの管理装置へ伝える機能である。
【０００６】
【発明が解決しようとする課題】このような画像形成装置ネットワークシステムにおける各画像形成装置の制御プログラムの書き換えを行なう際、上述のように１台ずつに付属している制御プログラム書換手段を利用して、作業者がそれぞれの画像形成装置に対して手作業によって書き換え作業を行なわねばならなかったので、大変な手間と時間を要していた。この発明はこのような問題に鑑み、ネットワークシステムを構成する各画像形成装置の制御プログラムの書き換えを、連結動作手段を利用して容易に且つ効率的に行えるようにすることを目的とする。
【０００７】さらに、上述のような外部通信手段を有する画像形成装置によるネットワークシステムの場合には、その外部通信手段を利用して、各画像形成装置の制御プログラムの書き換えを一層効率よく行なえるようにすることを目的とする。
【０００８】

【課題を解決するための手段】この発明は上記目的を達成するため、原稿を読み取る手段と、該手段によって読み取られた画像を印刷する手段とを有する複数台の画像形成装置がネットワークを介して接続され、その複数台の画像形成装置のうちの任意の１台で読み取られた画像情報を異なる画像形成装置に転送して印刷する連結動作手段と、単独動作か連結動作かを選択する手段とを有する画像形成装置ネットワークシステムにおいて、上記連結動作手段を用いて任意の１台の画像形成装置の制御プログラムを他の画像形成装置へ転送してその制御プログラムを書き換える制御プログラム書換手段を設けたものである。

【０００９】さらに、上記制御プログラム書換手段が、上記連結動作手段によって接続されたすべての画像形成装置のプログラムを同時に書き換える手段を有するようにするとよい。また、上記他の画像形成装置は、画像形成動作が終了したかあるいは画像形成動作を行なっていないときにのみ連結動作手段を通じた制御プログラムの書き換えを許可する手段を有するようにするのが望ましい。

【００１０】上記ネットワークシステムの画像形成装置が、公衆回線等の通信回線を通して外部と通信する外部通信手段とを有する場合には、ネットワークシステムを構成する複数台の画像形成装置のいずれかの外部通信手段によって外部から装置の制御プログラムを受信し、上記連結動作手段を用いて複数台の画像形成装置の制御プログラムを書き換える制御プログラム書換手段を設けることができる。

【００１１】その場合、外部から制御プログラムの受信を行なう画像形成装置は、画像形成動作を行っていない画像形成装置とするとよい。また、上記制御プログラム書換手段による制御プログラムの書き換えは、対象とする画像形成装置の画像形成動作が終了したかあるいは画像形成動作を行っていない時に行なうのが望ましい。

【００１２】

【発明の実施の形態】以下、図面を用いてこの発明の実施の形態の説明を行なう。図２に、この発明による画像形成装置ネットワークシステムを構成する画像形成装置の一実施形態である複写機システムを示す。この複写機システムは、複写機本体１の上部に自動原稿送り装置（以下「ＡＤＦ」と略称する）２を搭載し、側部に後処理装置であるフィニッシャ１００を接続している。複写機本体１の手前側上面には、図３に示す操作表示部３０を備えている。

【００１３】まず、この複写機システムによる通常の複写動作を説明する。ＡＤＦ２の原稿台２０に原稿の画像面を上にして置かれた原稿束は、操作表示部３０上のプリントキー（スタートキー）３４が押下されると、一番下の原稿が給送ローラ３と給送ベルト４によってコンタクトガラス６上の所定の位置に給送される。

【００１４】読み取りユニット５０によって、コンタクトガラス６上の原稿の画像データを読み取った後、その読み取りが終了した原稿は、給送ベルト４及び排送ローラ５によってＡＤＦ２の上面に排出される。さらに、原稿セット検知センサ７によって原稿台２０上に次の原稿があることを検知した場合は、次の原稿が上述と同様にコンタクトガラス６上に給送される。給送ローラ３、給送ベルト４、および排送ローラ５は図示しない共通のモータによって駆動される。

【００１５】複写機本体１内の第１トレイ８、第２トレイ９、第３トレイ１０に積載された転写紙は、各々第１給紙ユニット１１、第２給紙ユニット１２、第３給紙ユニット１３によって給紙され、縦搬送ユニット１４によって感光体１５に当接する位置まで搬送される。

【００１６】読み取りユニット５０によって読み取った画像データは、書き込みユニット５７からのレーザ光によって感光体１５に書き込まれ、現像ユニット２７を通過することによってトナー像が形成される。そして、転写紙は感光体１５の回転と等速で搬送ベルト１６によって搬送されながら、感光体１５上のトナー像が転写される。その後、定着ユニット１７にて画像を定着して、排紙ユニット１８によって後処理装置のフィニッシャ１００に排出される。

【００１７】フィニッシャ１００は、複写機本体１の排紙ローラ１９によって搬送された転写紙を、通常排紙ローラ１０２の方向とステープル処理部の方向とに導くことができる。切替板１０１を上に切り替えることによって、搬送ローラ１０５，１０７を経由して、ステープル台１０８に搬送することができる。ステープル台１０８に積載された転写紙は、一枚排紙される毎に紙揃え用のジョガー１０９によって紙端面が揃えられ、一部のコピー完了とともにステープラ１０６によって綴じられる。ステープラ１０６で綴じられた転写紙群は、自重によってステープル完了排紙トレイ１１０上に落下して、そこに収納される。

【００１８】一方、通常の排紙トレイ１０４は前後方向（図２の紙面に垂直な方向）に移動可能な排紙トレイであり、原稿毎あるいは、画像メモリによってソーティングされたコピー部毎に前後に移動して、排紙ローラ１０３によって排出されてくるコピー紙を簡易的に仕分けるものである。

【００１９】転写紙の両面に画像を作像する場合は、各給紙トレイ８～１０から給紙され一方の面に作像された転写紙を排紙トレイ１０４側に導かないで、経路切り替えのための分岐爪１１２を上側にセットすることによって、一旦両面給紙ユニット１１１にストックする。

【００２０】その後、両面給紙ユニット１１１にストックされた転写紙は再び感光体１５に作像されたトナー画像を転写するために、両面給紙ユニット１１１から再給紙され、他方の面に画像が転写される。この時は分岐爪

１１２が下側にセットされ、両面に画像が形成された転写紙を排紙トレイ１０４に導く。このように転写紙の両面に画像を作成する場合に、両面給紙ユニット１１１が使用される。

【００２１】感光体１５、搬送ベルト１６、定着ユニット１７、排紙ユニット１８、現像ユニット２７は図示しないメインモータによって駆動され、各給紙ユニット１１～１３はメインモータの駆動力が各々給紙クラッチによって伝達されて駆動される。縦搬送ユニット１４は、そのメインモータの駆動力が中間クラッチを介して伝達されて駆動される。

【００２２】図３は、この複写機システムの複写機本体１に設けられた操作表示部３０のレイアウトを示す図である。この操作表示部３０には、液晶タッチパネル３１、テンキー３２、クリア／ストップキー３３、プリントキー３４、モードクリアキー３５、および初期設定キー３６があり、液晶タッチパネル３１には、各種機能キー、部数やこの複写機システムの状態を示すメッセージ、およびこの発明による制御プログラム書き換え操作のための情報やキーなどが表示される。

【００２３】図１は、この操作表示部３０の液晶タッチパネル３１の表示例を示す図である。オペレータが液晶タッチパネル３１に表示されたキーにタッチすることによって、選択された機能を示すキーが黒く反転する。また、機能の詳細を指定しなければならない場合（たとえば変倍であれば変倍値など）は、そのキーにタッチすることによって、詳細機能の設定画面が表示される。このように、液晶タッチパネル３１は、ドット表示器を使用しているため、その時の最適な表示をグラフィカルに行なうことが可能である。

【００２４】図１に示す表示例において、左上には「コピーできます」、「お待ちください」等のメッセージを表示するメッセージエリアが設けられており、その右は、セットした枚数を表示するコピー枚数表示部、その下に画像濃度を自動的に調整する自動濃度キー、転写紙を自動的に選択する自動用紙選択キー、等倍の倍率を指定する等倍キーが並んで表示されている。

【００２５】さらに、下から２段目に右側から、コピーを一部ずつページ順に揃える処理を指定するソートキー、コピーをページ毎に仕分けする処理を指定するスタックキー、ソート処理されたものを一部ずつ綴じる処理を指定するステープルキー、およびこの発明に係る制御プログラム書き換え操作を行なう場合に指定するキーが並んで表示されている。

【００２６】そして、一番下に右側から拡大／縮小率をセットする変倍キー、両面モード又は分割モードを設定する両面／分割キー、集約コピーモードを設定するための集約キー、スタンプや日付やページなどの印字を設定する印字キーが表示されている。なお、指定されているモードはキーが網掛け表示されている。また、プログラム書き換え操作キーが指定されたときの処理については、追って詳細に説明する。

【００２７】ここで再び図２を用いて、この複写機システムによる画像読み取りおよび画像を感光体面上に潜像形成するまでの動作を説明する。潜像とは感光体面上に画像を光情報に変換して照射することにより生じる電位分布である。

【００２８】読み取りユニット５０は、原稿を載置するコンタクトガラス６と光学走査系とによって構成されており、光学走査系には、露光ランプ５１、第１ミラー５２、第２ミラー５５、第３ミラー５６、レンズ５３、およびＣＣＤイメージセンサ５４等で構成されている。露光ランプ５１および第１ミラー５２は図示しない第１キャリッジ上に固定され、第２ミラー５５および第３ミラー５６は図示しない第２キャリッジ上に固定されている。

【００２９】原稿像を読み取るときには、光路長が変わらないように、第１キャリッジと第２キャリッジとが２対１の相対速度で機械的に走査される。この光学走査系は図示しないスキャナモータによって駆動される。原稿画像は、ＣＣＤイメージセンサ５４によって読み取られ、電気信号に変換されて処理される。レンズ５３およびＣＣＤイメージセンサ５４を図１において左右方向に移動させることにより、画像倍率が変わる。すなわち、指定された倍率に対応してレンズ５３およびＣＣＤイメージセンサ５４の左右方向に位置が設定される。

【００３０】書き込みユニット５７は、レーザ出力ユニット５８、結像レンズ５９、ミラー６０で構成され、レーザ出力ユニット５８の内部には、レーザ光源であるレーザダイオードおよびモータによって高速定速回転する回転多面鏡（ポリゴンミラー）を備えている。レーザ出力ユニット５８より照射されるレーザ光は、定速回転するポリゴンミラーで偏向され、結像レンズ５９を通り、ミラー６０で折り返されて感光体１５の表面上に集光結像する。

【００３１】偏向されたレーザ光は、感光体１５が回転する方向と直交する方向（主走査方向）に露光走査され、後述する図９に示す画像処理部のセレクタ６４より出力された画像信号のライン単位の記録を行なう。感光体１５の回転速度と記録密度に対応した所定の周期で主走査を繰り返すことによって、感光体１５の表面上に画像（静電潜像）が形成される。

【００３２】上述のように、書き込みユニット５７のレーザ出力ユニット５８から出力されるレーザ光が、画像作像系の感光体１５に照射される。感光体１５の一端近傍のレーザビームが照射される位置に、図示しないが主走査同期信号を発生するビームセンサが配置されている。そのビームセンサによって発生される主走査同期信号をもとに、主走査方向の画像記録開始タイミングの制御及び後述する画像信号の入出力を行なうための制御信

号の生成を行なう。

【００３３】次に、この複写機システムにおける画像処理部（画像読み取り部と画像書き込み部）の構成について、図４を用いて説明する。図２に示した露光ランプ５１から放射された光は原稿面を照射し、原稿面からの反射光をレンズ５３により結像し、ＣＣＤイメージセンサ５４によって受光して光電変換し、Ａ／Ｄコンバータ６１によって２値あるいは多値のデジタル信号に変換し、量子化する。デジタル信号に変換された画像信号は、シェーディング補正部６２によってシェーディング補正がなされた後、ＭＴＦ・γ補正部６３によってＭＴＦ補正やγ補正などの画像補正がなされる。

【００３４】なお、シェーディング補正は、原稿を照射する光源の照射ムラや、ＣＣＤイメージセンサの感度のバラツキを補正することである。ＭＴＦ補正は、光学系によるボケを補正することであり、γ補正はＣＣＤイメージセンサの感度の非直線性を補正することである。

【００３５】セレクタ６４では、画像信号の送り先を変倍部７１またはメモリコントローラ６５にする切り替えが行なわれる。変倍部７１を経由した画像信号は変倍率に合わせて拡大縮小され、書き込みユニット５７に送られる。メモリコントローラ６５とセレクタ６４間は、双方向に画像信号を入出力可能な構成となっている。

【００３６】この画像処理部（ＩＰＵ）には、図２に示した読み取りユニット５０から入力される画像データ以外にも、外部から供給される画像データ（例えばパーソナルコンピュータなどのデータ処理装置から出力されるデータ）に基づいて、印字イメージデータ発生装置（印字ユニット）７４によって発生される印字データも処理できるように、２個の印字合成部７２，７３が設けられている。

【００３７】この画像処理部にはさらに、メモリコントローラ６５などへの設定や、読み取りユニット５０及び書き込みユニット５７の制御を行なうＣＰＵ６８、そのプログラムやデータを格納するＲＯＭ６９，ＲＡＭ７０、外部とのデータおよびアドレスのインタフェースとなるＩ／Ｏポート７５及びＳＣＳＩ（スモール・コンピュータ・システム・インタフェース）ドライバ７６とを備えている。このＣＰＵ６８は、メモリコントローラ６５を介して画像メモリ６６のデータの書き込みおよび読み出しを行なうことができる。

【００３８】なお、図示は省略しているが、この複写機システムは、公衆回線等と接続して外部と通信する外部通信手段である通信制御回路も備えている。

【００３９】ここで、図５を用いて図４のセレクタ６４における１ページ分の画像信号について説明する。図５において、フレームゲート信号／ＦＧＡＴＥは、１ページの画像データの副走査方向の有効期間を表わしている。主走査同期信号／ＬＳＹＮＣは、１ライン毎の主走査同期信号であり、この信号が立ち下がった後の所定クロックで、画像信号が有効となる。主走査方向の画像信号が有効であることを示す信号が、ラインゲート信号／ＬＧＡＴＥである。

【００４０】これらの信号は、画素クロック信号ＶＣＬＫに同期しており、ＶＣＬＫの１周期に対し１画素のデータが送られてくる。この画像処理部は、画像入力、出力それぞれに対して別個のフレームゲート信号／ＦＧＡＴＥ，主走査同期信号／ＬＳＹＮＣ，ラインゲート信号／ＬＧＡＴＥ，および画素クロック信号ＶＣＬＫの発生手段を有しており、さまざまな画像入出力の組み合わせが実現可能になる。

【００４１】図６を用いて、図４におけるメモリコントローラ６５と画像メモリ６６の詳細を説明する。メモリコントローラ６５は、入力データセレクタ８１、画像合成部８２、１次圧縮／伸長部８３、出力データセレクタ８４、２次圧縮／伸長部８５を有している。これらの各部への制御データの設定は図４に示したＣＰＵ６８により行なわれる。図６におけるアドレスおよびデータは画像データを示しており、ＣＰＵ６８に接続されるデータのアドレスは図示していない。

【００４２】画像メモリ６６は、１次及び２次記憶装置８６，８７からなる。１次記憶装置８６は、入力画像データの転送速度に略同期してメモリへのデータ書き込み、または画像出力時のメモリからのデータ読み出しが高速に行なえるように、例えばＤＲＡＭなどの高速アクセスが可能なメモリを使用する。

【００４３】また、１次記憶装置８６は、処理を行なう画像データの大きさにより複数のエリアに分割して、画像データの入出力を同時に実行可能な構成（メモリコントローラとのインタフェース部）をとっている。各分割したエリアに画像データの入力と出力をそれぞれ並列に実行可能にするために、メモリコントローラ６５とのインタフェースにリード用とライト用の二組のアドレス・データ線が接続されている。これにより、画像をあるエリアに入力（ライト）する間に他のエリアより画像を出力（リード）するという動作が可能になる。

【００４４】２次記憶装置８７は、入力された画像の合成やソーティングを行なうためにデータを保存しておく大容量のメモリである。１次記憶装置８６および２次記憶装置８７とも、高速アクセス可能なメモリ素子を使用すれば、１次，２次の区別なくデータの処理が行なえ、制御も比較的簡単になるが、ＤＲＡＭなどの素子は高価なため、２次記憶装置８７にはアクセス速度はそれほど速くはないが、安価で大容量の記録媒体を使用し、入出力データの処理を１次記憶装置を介して行なう構成になっている。

【００４５】上述のような画像メモリの構成を採用することにより、大量の画像データの入出力、保存、加工などの処理が可能な画像形成装置を、安価にかつ比較的簡単な構成で実現することが可能になる。

【００４６】次に、このメモリコントローラ６５の動作の概略を説明する。まず、画像入力（画像メモリへの保存）について説明する。入力データセレクタ８１は複数のデータの内から、画像メモリ６６の１次記憶装置８６への書き込みを行なう画像データの選択を行なう。

【００４７】入力データセレクタ８１によって選択された画像データは、画像合成部８２に供給され、すでに画像メモリ６６に保存されているデータとの合成を行なう。画像合成部８２によって処理された画像データは、１次圧縮／伸長部８３によりデータを圧縮し、その圧縮後のデータを１次記憶装置８６に書き込む。１次記憶装置８６に書き込まれたデータは、必要に応じて２次圧縮／伸長部８５で更に圧縮を行なった後、２次記憶装置８７に保存される。

【００４８】画像出力時には、１次記憶装置８６に記憶されている画像データの読み出しを行なう。出力対象となる画像が１次記憶装置８６に格納されている場合には、１次記憶装置８６から読み出した画像データを１次圧縮／伸長部８３で伸長し、その伸長後の画像データ、もしくは伸長後の画像データと入力画像データとの画像合成を行なった後の画像データを、出力データセレクタ８４で選択して出力する。

【００４９】画像合成部８２は、１次記憶装置８６から読み出した画像データと、入力画像データとの合成（画像データの位相調整機能を有する）と、合成後の画像データの出力先の選択（画像出力、１次記憶装置８６へのライトバック、両方の出力先への同時出力）などの処理を行なう。

【００５０】出力対象となる画像データが１次記憶装置８６に格納されていない場合には、２次記憶装置８７に格納されている出力対象画像データを読みだして、２次圧縮／伸長部８５で伸長し、その伸長後の画像データを１次記憶装置８６に書き込んでから、上述したのと同じ画像出力動作を行なう。

【００５１】このシステムにおいて「動作予約」とは、ＰＰＣ（普通紙複写機）においては図２に示した定着ユニットの加熱中などの時はコピー動作を開始できないが、モード設定および現行のセットを終了させて予約することにより、定着ユニットが加熱終了後、コピー動作可能になった時点で自動的にコピー動作を開始する機能のことである。

【００５２】この実施形態では、定着ユニットの加熱中を動作予約可能対象としているが、これ以外にも時間の経過とともに動作可能になるものについては、対象にすることができる。大量給紙装置における給紙トレイの上昇時間、書き込み装置におけるポリゴンモータの回転が安定するまでの時間、現像ユニットへのトナー補給動作中などが考えられる。

【００５３】図７および図８は、この発明を実施する他の画像形成装置のハード構成図である。これらの画像形成装置は、画像読み取り部Ａ、画像書き込み部Ｂ、システムコントローラＣ、メモリユニットＤ、利用者制限器機Ｅ、人体検知センサＦ、操作部（操作表示部と同じ）Ｇ、遠隔診断装置（ＣＳＳ）Ｈ、および時計Ｉから構成されている。ただし、メモリユニットＤはメモリ機能を実現する場合にのみ必要であり、通常のコピー機能を実現することだけを考えれば必要ではない。

【００５４】さらに、時計Ｉは、ある特定の時間になったら装置をブートしたり、シャットダウンするようなウィークリタイマ機能を実現する場合のみ必要である。また、人体検知センサＦは、予熱モード時にこの装置の前にユーザが近づいてきたときに自動的に予熱モードを解除する機能を実現する場合のみ必要であり、遠隔診断装置（ＣＳＳ）Ｈは、遠隔診断すなわち遠隔地からモニタする機能であるため、このような機能が必要な場合のみ装着されればよい。しかし、これを設けない場合でも、外部と通信するための通信制御回路は設ける必要がある。

【００５５】システムコントローラＣは、複写モードを実行する上で、画像書き込み部Ｂで画像形成するために、紙搬送処理、電子写真プロセス処理、異常状態や給紙カセット状態（用紙の有無の検知など）等の監視を行ない、また画像読み取り部Ａで原稿の画像を読み取るために、スキャナ動作や光源のＯＮ／ＯＦＦなどを制御するコントローラの総称である。

【００５６】デジタルＰＰＣ（普通紙複写機）の大きな特徴に、画像を電気信号に変換して読み込み、電気信号を画像書き込み部（これを画像形成装置ともいう）で復元することである。このとき、読み取った画像の電気信号を様々に変化させて伝達する手段を持つことによって、従来のアナログＰＰＣでは実現できなかった分野に応用できるようになった。

【００５７】例えば、ＦＡＸ，ページプリンタ，スキャナ，ファイルシステムなどの機能を実現できるほか、最近ではＰＰＣ機能の実行時においても、読み取った画像データを一旦ＤＲＡＭなどの記憶装置に記憶させ、必要に応じてその画素データを読み出すことによって、１回のスキャンで複数枚のプリントを実行したり、複数の原稿の画像を１枚の転写紙にプリントしたりすることも実現されている。これらのデジタルＰＰＣシステムならでは実現できる機能を「拡張機能」あるいは「アプリ」と表現する。

【００５８】さらに、最近のデジタルＰＰＣでは拡張機能を一つ搭載するだけではなく、複数のアプリケーションを同時に搭載するようになってきた。このように、一つの資源を共有するデジタルＰＰＣを「システム」と表現し、このシステムを制御するコントローラも「システムコントローラ」と呼ぶ。

【００５９】予熱とは、定着温度を一定温度（例えば１０℃）下げて制御し、操作部Ｇの表示を消すことによ

り、消費電力を節約するモードである。このモードの設定は、操作部Ｇでのキー入力や、設定によっては動作および操作がなくなってから一定時間経過後に自動的になされる。このモードの解除は、操作部Ｇでのキー入力や、設定によっては人体検知センサＦにより装置の前に人が立ったことを検知したときに解除される。

【００６０】図７および図８中のメモリユニットＤ内のＤＲＡＭブロックは、画像読み取り部Ａで読み取った画像信号を記憶するためのもので、システムコントローラＣからの要求に応じて、画像書き込み部Ｂに保存されれている画像データを転送することができる。

【００６１】メモリユニットＤ内の圧縮ブロックは、ＭＨ，ＭＲ，ＭＭＲ方式などの圧縮機能を具備しており、一旦読み取った画像を圧縮して、メモリ（ＤＲＡＭ）の使用効率の向上を図るために設けている。また、画像書き込み部Ｂからの読み出しアドレスとその方向を変えることにより、画像の回転を実現できる。

【００６２】利用者制限器機Ｅは、電子写真プロセスを使用しているＰＰＣは消耗品の消費量が多いため、利用者を特定あるいは限定したり、利用者毎あるいは利用部署毎に転写紙の使用枚数を管理したりするために設けられるものであり、「コインラック」、「キーカウンタ」、「キーカード」、「プリペイドカード」等を使用するものや、暗証コードを使用するものなどがある。

【００６３】図７のハード構成では、画像読み取り部Ａ、画像書き込み部Ｂ、メモリユニットＤ、および遠隔診断装置Ｈの制御は、システムコントローラＣ内のＣＰＵのみで行なっている。一方、図８のハード構成では、画像読み取り部Ａ、画像書き込み部Ｂ、およびメモリユニットＤにそれぞれＣＰＵを持たせ、システムコントローラＣから各部のＣＰＵへのコマンドを制御信号線で伝達するようにしている。このように、この発明を実施する画像形成システムのハード構成は自由にできる。

【００６４】図９は、遠隔診断装置（ＣＳＳ）を用いた画像形成装置管理システムの構成例を示している。サービス拠点に設置されている管理装置Ｑとユーザの元に設置されているＰＰＣ等の複数の画像形成装置Ｐによるネットワークシステムとを公衆回線網Ｎを介して接続している。ユーザ側には管理装置Ｑとの通信を制御するための通信コントロール装置Ｒが設置されており、ユーザ元の各画像形成装置Ｐはこの通信コントロール装置Ｒに接続されている。

【００６５】通信コントロール装置Ｒには、電話機ＴＥＬやファクシミリ装置ＦＡＸが接続可能になっており、ユーザの既存の回線に挿入する形で設置が可能になっている。通信コントロール装置Ｒには複数の画像形成装置Ｐが接続可能になっているが、もちろん単数の場合もある。これらの画像形成装置Ｐは同型のものである必要はなく、異なる機種でも構わない。さらには、ＰＰＣ以外のものでも構わない。

【００６６】ここでは説明の便宜上、１台の通信コントロール装置Ｒには最大５台の画像形成装置Ｐが接続可能であるとする。通信コントロール装置Ｒと複数の画像形成装置ＰとはＲＳ－８５企画によりマルチドロップ接続されている。

【００６７】通信コントロール装置Ｒと各画像形成装置Ｐとの間の通信制御は基本型データ伝送制御手段により行なわれる。通信コントロール装置Ｒを制御局としたセントラライズド制御のポーリング／セレクティング方式でデータリンクの確立を行うことにより、任意の画像形成装置との通信が可能になっている。各画像形成装置Ｐはアドレス設定スイッチによって固有の識別値を設定できるようになっており、これによって各画像形成装置Ｐのポーリングアドレス、セレクティングアドレスが決定される。

【００６８】この画像形成装置管理システムを利用して、管理装置Ｑから画像形成装置Ｐに制御プログラム送信し、それを受信した画像形成装置Ｐが、自己の制御プログラムを書き換えると共に、各画像形成装置間の連結動作手段を利用して他の画像形成装置Ｐの制御プログラムも書き換えることが可能である。

【００６９】図１０は、この発明を実施する画像形成装置ネットワークシステムの一例であるネットワークコピーのシステム構成例を示したものである。同図では８台のデジタル複写機を、ネットワークインターフェースによって接続してネットワーク化しているが、当然接続する複写機の台数は限定する必要はない。このネットワークを図９に示した画像形成装置管理システムの場合と同様に、通信コントロール装置を介して公衆回線網に接続することができる。

【００７０】次に、図１１を用いて、この発明を実現するためのハード構成例についてさらに説明する。この図１１に示す各デジタルＰＰＣ－Ⅰ，Ⅱのハード構成は、図７に示したものと略同様な構成をとっており、図７の各部の同一の符号を付してその説明は省略する。但し、各デジタルＰＰＣのメモリユニットＤ内には、読み取った画像を外部のネットワーク上に転送し、あるいはネットワーク上からの画像データをメモリユニット内のＤＲＡＭブロック部に保存するために、それぞれＳＣＳＩコントローラを設け、それをネットワーク手段としてのＳＣＳＩで接続している。

【００７１】当然のことながらネットワーク通信手段には、例えばイーサネットを物理手段として用い、データ通信にＯＳＩ参照モデルのＴＣＰ／ＩＰ通信を用いるなど、種々の手段が考えられる。また、図１１のような構成を用いることにより、上述のように画像データの転送は勿論のこと、ネットワーク上に存在する各ＰＰＣの機内状態の通知、あるいは後述するリモート出力コマンドのような制御コマンドや設定コマンドなどの転送も行なえる。

【００７２】次に、この図１１のデジタルＰＰＣ－Ｉの画像読み取り部Ａで読み取った画像を、デジタルＰＰＣ－IIの画像書き込み部Ｂに転送する連結動作（リモート出力）について説明する。図１２は、そのソフトウェアの概念図である。図１２中に示す「コピーアプリ」は複写動作を実行するためのコピーシーケンスを実行するアプリケーション、「入出力制御」はデータを論理／物理変換するレイア（デバイスドライバ）である。

【００７３】操作部コントローラは、ＭＭＩ（Ｍａｎ　Ｍａｃｈｉｎｅ　Ｉｎｔｅｒｆａｃｅ）を実行するレイア（ＬＣＤ表示やＬＥＤ点灯／消灯、キー入力スキャンなどを論理レベルで行なうレイア）であり、「周辺機コントローラ」は自動両面ユニットやソータ、ＡＤＦなどのＰＰＣに装着される周辺機のコントロールを論理レベルで実行するレイアである。「画像形成装置コントローラ」、「画像読取装置コントローラ」、「メモリユニット」は前述の通りである。

【００７４】また、「デーモンプロセス」は、ネットワーク上にある他の装置からプリント要求が依頼された場合に、メモリユニット内に保存されている画像データ読み出し、「画像形成装置」に画像データを転送する役目を行なうアプリケーションとして存在している。当然のことながら、「デーモンプロセス」がメモリユニットから画像データを読み出し、プリント動作を実行する前に、ネットワーク上の他の装置からの画像転送は終了しておかなければならない。

【００７５】ここで操作部、周辺機、画像形成装置、画像読取装置、メモリユニットはそれぞれのＰＰＣが保有するリソース（資源）として扱われる。図１１の「デジタルＰＰＣ－Ｉ」が自身の各リソースを使用して複写動作を実行する場合（プリントスタートキー押下時）には、システム制御を実行する「システムコントローラ」に対して、「画像形成装置」、「画像読取装置」、あるいは必要に応じて「周辺機」、「メモリユニット」の各リソースを要求する。

【００７６】「システムコントローラ」は「コピーアプリ」からの要求に対して、リソースの使用権の調停を行ない、「コピーアプリ」にその調停結果（使用可否）を通知する。「デジタルＰＰＣ－Ｉ」がスタンドアローンで使用される場合（ネットワーク接続されない状態）には、システムが保有するすべてのリソースはすべて「コピーアプリ」が占有可能な状態であるため、即時に複写動作が実行される。

【００７７】一方、この実施形態のようにネットワーク上に存在する別のデジタルＰＰＣ（以下「遠隔デジタルＰＰＣ」という）のリソースを使用してプリンと動作を実行する場合には、遠隔デジタルＰＰＣの「システム制御部」に対してリソースの使用権を要求する。

【００７８】遠隔デジタルＰＰＣの「システムコントローラ」は要求にしたがってリソースの調停を行ない、その結果を要求元のデジタルＰＰＣの「コピーアプリ」に通知する。その「コピーアプリ」は、使用権が許可された場合は画像の読み取りを実行し、自身のメモリユニット内への画像記憶が終了すると、外部インタフェース（この実施例ではＳＣＳＩ）を介して、リモート出力先のデジタルＰＰＣのメモリユニットに画像転送を行なう。

【００７９】画像転送が終了すると、リモート出力先のデジタルＰＰＣの「デーモンプロセス」に対してプリントを実行するための各条件（給紙口、排紙口、プリント枚数など）を送信した後に、「プリント開始」コマンドを送信する。リモート出力先の「デーモンプロセス」は「プリント開始」コマンドを受信すると、自身（リモート出力を実行するデジタルＰＰＣ）の「システムコントローラ」に対してプリント開始を要求し、リモート出力が「システムコントローラ」によって実行される。

【００８０】「デジタルＰＰＣ－Ｉ」によって「デジタルＰＰＣ－II」のメモリユニットが使用されている場合は、「デジタルＰＰＣ－II」のメモリユニットは、「デジタルＰＰＣ－II」（あるいは図１０に示したように複数のデジタルＰＰＣがネットワーク上に接続される場合は「デジタルＰＰＣ－Ｉ」以外のデジタルＰＰＣ）のアプリケーションの使用は不可状態となる。

【００８１】以下、図１３～図１５のフローチャートを参照して、上述した各画像形成装置において、連結動作手段を用いて制御プログラムの書き換えを行なう制御プログラム書換手段、すなわちこの発明の特徴とする機能について説明する。この機能は、図７，８，および１１に示したシステムコントローラＣ、あるいは図１２に示したシステム制御部（システムコントローラ）と、図１０，図１１，図１２に示したネットワークインタフェースによってなされる。

【００８２】まず、図１３のフローチャートを用いて、この発明の第１の実施形態の説明を行う。この第１の実施形態は、ネットワークシステムを構成する各画像形成装置が普段は通常の連結動作可能な画像形成装置として機能する。なお、以後の各フローチャートにおいては、「ステップ」を「Ｓ」と略記している。まず、図１３の（ａ）に示すフローチャートによって、一つの画像形成装置の制御プログラムを手動で書き換える方法について説明する。この方法自体は従来の制御プログラム書き換え方法と変わるところはない。

【００８３】制御プログラムを書き換える画像形成装置を装置Ａとすると、まずその装置Ａの電源をＯＦＦにし（Ｓ１）、その装置Ａの所定の場所（スロット）に、書き換える新しい制御プログラムが記録されたＲＯＭカードを挿入する（Ｓ２）。次に、その装置Ａの電源ＯＮにすると（Ｓ３）、図３に示した操作表示部３０の図１に示した液晶タッチパネル３１にプログラム書き換え操作キーを表示し、そのタッチによる書き換え開始を待つ

（Ｓ４）。所定時間内に書き換え開始が指示されない場合は、処理を終了する。

【００８４】ここで書き換え開始が指示されると、操作パネルロックを行ない（Ｓ５）、図３に示した操作表示部３０によるプログラム書き換えに関する以外の操作入力を、それ以降作業終了まで受け付けないようにし、ＲＯＭカードの制御プログラムを読み出して、本体内のプログラムメモリに書き込まれている制御プログラムの書き換え動作を開始する（Ｓ６）。これが終了すると本体リセットをかけて装置Ａの再起動を行なう（Ｓ７）。

【００８５】次に、すでに新しい制御プログラムに書き換えられている画像形成装置（前述の装置Ａ）がある状態で、その装置Ａから連結動作手段を用いて、まだ書き換えられていない他の画像形成装置（装置Ｂとする）の制御プログラムを書き換える方法について、図１３の（ｂ）に示すフローチャートによって説明する。

【００８６】まず、装置Ｂの操作表示部３０により、サービスマン設定モード内のプログラム転送項目を選択し（Ｓ８）、制御プログラムを書き換えた装置Ａの機械番号を入力する（Ｓ９）。それ以降、操作パネルロックを行ない（Ｓ１０）、操作表示部３０にデータ受信中であることを表示し、作業終了まで操作入力を受け付けないようにする。そして、装置Ａより制御プログラムを受信して本体内のプログラムメモリに書き込まれている制御プログラムの書き換えを行ない（Ｓ１１）、これが終了すると本体リセットをかけて装置Ｂの再起動を行なう（Ｓ１２）。

【００８７】この実施形態において、装置Ｂはフラッシュ ＲＯＭなどによる手動でのプログラム書き換え手段を持っている必要はない。したがって、画像形成装置ネットワークシステム内のいずれかの画像形成装置が手動でのプログラム書き換え手段を持っていればよく、そのプログラムの書き換え手段を他の画像形成装置の制御プログラムの書き換えにも有効に用いることができ、無用なハードウェアの装備を不要にしてコストを削減することができる。

【００８８】つぎに、図１４のフローチャートを用いて、この発明の第２の実施形態について説明する。図１４の（ａ）は制御プログラム送信側の画像形成装置である装置Ａの動作を示し、（ｂ）は制御プログラム受信側にの画像形成装置の動作を示す。この第２の実施形態においても、ネットワークシステムを構成する各画像形成装置が、普段は通常の連結動作可能な画像形成装置として機能する。

【００８９】まず、プログラム書き換え手段を備えた画像形成装置である装置Ａ側の動作は、図１４の（ａ）のフローチャートに示すように、操作表示部３０から、サービスマン設定モード内の全装置制御プログラム書き換え実行項目を選択設定する（Ｓ２１）。それにより、操作表示部の操作パネルをロックしてユーザの操作を受け付けないようにする（Ｓ２２）。

【００９０】ついで、連結動作手段で接続されたすべての画像形成装置の現在の状態を、装置固有の機器番号の小さい順にチェックする（Ｓ２３）。その際、プログラムバージョンが装置Ａと同じ装置に関しては、プログラム書き換え対象から外す。そして、電源ＯＦＦ状態の装置の有無をチェックして（Ｓ２４）、電源ＯＦＦ状態の装置があれば、その装置の電源ＯＮを要請するメッセージを操作パネルに表示する（Ｓ２５）。電源ＯＦＦ状態の装置がなければそのままステップ２６へ進む。

【００９１】そして、書き換え対象と判断して全装置に対して書き換え要求を送信し（Ｓ２６）、その後、全装置へ制御プログラムを送信する（Ｓ２７）。但し、書き換え要求を送信した相手側の装置が画像形成動作中の場合は、その画像形成動作を終了して待機状態になるのを待って、制御プログラムを送信する。

【００９２】そのため、受信側の装置は図１４の（ｂ）のフローチャートに示すように、書き換え要求信号を受信すると（Ｓ３０）、現在の装置の状態が待機中であるか否かを判断して（Ｓ３１）、待機状態である場合には、直ちに装置Ａに対して書き換え可能応答を送信する（Ｓ３２）が、待機状態でない場合には、待機状態になるまで待ってから書き換え応答を送信する。

【００９３】それによって、前述した装置Ａ側は、書き換え可能応答を受信した順にその装置へ制御プログラムデータを送信する（Ｓ２７）。受信側の装置は、装置Ａから制御プログラムを受信すると（Ｓ３３）、本体内のプログラムメモリに書き込まれている制御プログラムを書き換え（Ｓ３４）、それが終了すると本体リセットを行なう（Ｓ３５）。

【００９４】この動作を書き換え対象と判断されたすべての装置に関して行ない、すべての装置で制御プログラムの書き換え作業が完了した時点で、装置Ａの操作表示部に完了メッセージを表示し、すべての動作が完了する。

【００９５】この実施形態によれば、連結動作手段によって接続されている全ての画像形成装置に対して、一度の操作でその各制御プログラムの書き換えを行なうことができるので、制御プログラム書き換え作業の一層の簡易化と作業時間の短縮を図ることができる。また、制御プログラムの受信および書き換え動作を画像形成装置が待機中のときにのみ行なえるようにしたことにより、制御プログラム置き換え作業の信頼性改善を図ることができる。

【００９６】次に、この発明の第３の実施形態について図１５のフローチャートと図１６のブロック図を用いて説明する。この第３の実施形態は図９によって前述した画像形成装置管理システムと同様に、第２の実施形態までのネットワークシステムに加え、図１６に示すように通信コントロール装置Ｒを一つ用意し、ネットワークシ

ステムを構成する各画像形成装置Ｐ，Ｐ′に設けた外部通信装置１２２，１２２′と、シリアルインタフェース１３１，１３１を介して接続する。

【００９７】画像形成装置Ｐ，Ｐ′は、外部通信装置１２２，１２２′との外部通信インタフェース１３２，１３２′も、他の画像形成装置との連結インタフェース１３３も、システムコントローラＣ，Ｃ′で制御する。通信コントロール装置Ｒは、公衆回線Ｎを介してサービスセンター（管理装置）Ｑと接続されている。また、外部通信インタフェース１３２，１３２′やシリアルインタフェース１３１よりも、連結インタフェース１３３の方が信頼性や通信速度において優れている。

【００９８】この画像形成装置ネットワークシステムにおいて、画像形成装置ＰおよびＰ′は、通信コントロール装置Ｒを介して入力された外部からの情報を、外部通信装置１２２又は１２２′を通して受信できる。逆に、画像形成装置Ｐ又はＰ′からの情報は、外部通信装置１２２又は１２２′および通信コントロール装置Ｒを通して、外部のサービスセンターＱへ送信される。

【００９９】また、画像形成装置Ｐは、連結インタフェース１３３を用いて画像形成装置Ｐ′と通信を行ない、外部通信装置１２２′を介して外部と通信ができ、画像形成装置Ｐ′も、連結インタフェース１３３を用いて画像形成装置Ｐと通信を行ない、外部通信装置１２２を介して外部と通信することができる。なお、この例は２台の画像形成装置によってネットワークが形成されている場合を示しているが、画像形成装置の数は勿論２台に限定されるものではない。

【０１００】この第３の実施形態による画像形成装置の制御プログラム書き換え動作を図１５のフローチャートによって説明する。この第３の実施形態でも、ネットワークシステムを構成する各画像形成装置Ｐ，Ｐ′は、普段は通常の連結動作可能な画像形成装置として機能する。

【０１０１】通信コントロール装置ＲがサービスセンターＱよりプログラム転送要求を受信すると、外部通信手段を持つ画像形成装置Ｐ，Ｐ′の中で現在待機中の装置の有無を判断し（Ｓ４１）、待機中の装置がなければ、サービスセンターＱへ書き換え不可応答を返送する（Ｓ４９）。待機中の装置があれば、サービスセンターＱへその装置（画像形成装置Ｐ又はＰ′：装置Ａとする）の書き換え可能応答を返送する（Ｓ４２）。

【０１０２】そして、その装置Ａの操作パネルにプログラム書き換え中であることを表示するとともにユーザ操作無効処理をして、ユーザの操作を受け付けないようにする（Ｓ４３）。

【０１０３】その後、サービスセンターＱから受信する書き換え用の制御プログラムのデータを外部通信装置１２２又は１２２′を介して装置Ａへ転送する（Ｓ４４）。その制御プログラムを受信した装置Ａは、その制御プログラムをプログラムメモリである不揮発ＲＯＭに書き込み、本体をリセットする（Ｓ４５）。これによって、装置Ａの制御プログラムの書き換えが完了する。

【０１０４】次に、この装置Ａと通信可能な他の装置ｎの制御プログラムの書き換えを順次行なう。まず、最初の装置ｎが待機中か否かをチェックし（Ｓ４６）、待機中でなければｎを次の装置の番号へ変更する（Ｓ５０）。装置ｎが待機中であった場合は、その装置ｎへ制御プログラムのデータを送信し、そのプログラムメモリの制御プログラムを書き換える（Ｓ４７）。

【０１０５】そして、すべての装置の制御プログラムの書き換えが済んだが否かを判断し（Ｓ４８）、済んでいれば処理を終了するが、まだ済んでいない装置があれば、装置ｎを次の装置へ変更して、ステップ４６へ戻り（Ｓ５１）、上記の処理を繰り返す。

【０１０６】この第３の実施形態によると、連結動作手段によって連結された画像形成装置群内の１台が代表して、外部から新たな制御プログラムを受信してプログラムメモリの書き換えを行うことにより、その制御プログラムのデータを用いて他の複数の画像形成装置の制御プログラムを置き換えることができ、通信の信頼性改善と通信コストの削減を図ることができる。

【０１０７】

【発明の効果】以上説明したきたように、この発明によれば、ネットワークシステムを構成する各画像形成装置の制御プログラムの書き換えを、連結動作手段を利用して容易に且つ効率的に行なうことができる。さらに、外部通信手段を有する画像形成装置によるネットワークシステムの場合には、その外部通信手段を利用して、各画像形成装置の制御プログラムの書き換えを一層効率よく行なうことができる。

【図面の簡単な説明】

【図１】図３に示す操作表示部の液晶タッチパネル３１による表示例を示す図である。

【図２】この発明による画像形成装置ネットワークシステムを構成する画像形成装置の一例を示す複写機システムの模式的断面図である。

【図３】図２に示した複写機システムの複写機本体１に設けられる操作表示部のレイアウトを示す平面図である。

【図４】図２に示した複写機システムにおける画像処理部（画像読み取り部と画像書き込み部）の構成を示すブロック図である。

【図５】図４に示したセレクタ６４における１ページ分の画像信号の波形図である。

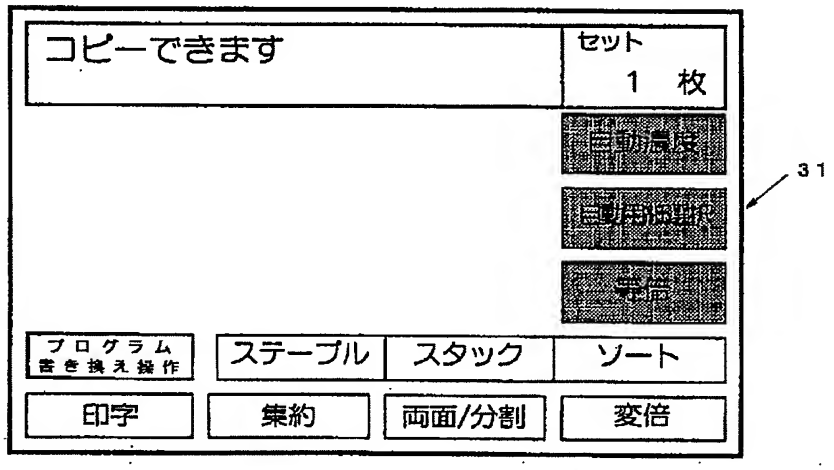
【図６】図４に示した画像処理部のメモリコントローラ６５と画像メモリ６６の構成を示すブロック図である。

【図７】この発明を実施する他の画像形成装置のハード構成図である。

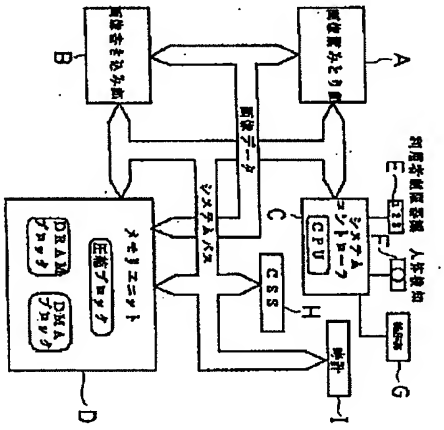
【図８】この発明を実施するさらに他の画像形成装置の

ハード構成図である。
【図９】この発明を実施するのに利用できる画像形成装置管理システムの構成図ある。
【図１０】この発明を実施できるネットワークコピーのシステム構成図である。
【図１１】この発明を実施する２台のデジタルＰＰＣを接続したシステムの構成図である。
【図１２】同じくそのソフトウエアの概念図である。
【図１３】この発明の第１の実施形態における手動による制御プログラム書き換え操作を示すフロー図である。
【図１４】この発明の第２の実施形態における半自動による制御プログラム書き換え操作を示すフロー図である。
【図１５】この発明の第３実施形態のおける自動的な制御プログラム書き換え操作を示すフロー図である。
【図１６】この発明の第３の実施形態の画像形成装置ネットワークシステムの構成例を示すブロック図である。
【符号の説明】
１：複写機本体　　２：自動原稿送り装置
３：給紙ローラ　　４：給送ベルト
５：排送ローラ　　６：コンタクトガラス
８：第１トレイ　　９：第２トレイ
１０：第３トレイ　　１１：第１給紙ユニット
１２：第２給紙ユニット　　１３：第３給紙ユニット
１４：縦搬送ユニット　　１５：感光体
１６：搬送ベルト　　１７：定着ユニット
１８：排紙ユニット　　２０：原稿台
３０：操作表示部　　３１：液晶タッチパネル
３２：テンキー　　３３：クリア／ストップキー
３４：プリントキー　　３５：モードクリアキー
３６：初期設定キー　　５０：読み取りユニット
５７：書き込みユニット　　１００：フィニッシャ
６５：メモリコントローラ　　６６：画像メモリ
６８：ＣＰＵ　　６９：ＲＯＭ　　７０：ＲＡＭ
７６：ＳＣＳＩドライバ　　Ａ：画像読み取り部
Ｂ：画像書き込み部
Ｃ，Ｃ′：システムコントローラ
Ｄ：メモリユニット　　Ｅ：利用者制限器機
Ｆ：人体検知センサ　　Ｇ：操作部（操作表示部）
Ｈ：遠隔診断装置（ＣＳＳ）　　Ｉ：時計
Ｐ，Ｐ′：画像形成装置（ＰＰＣ）　　Ｑ：管理装置
Ｒ：通信コントロール装置　　Ｎ：公衆回線網

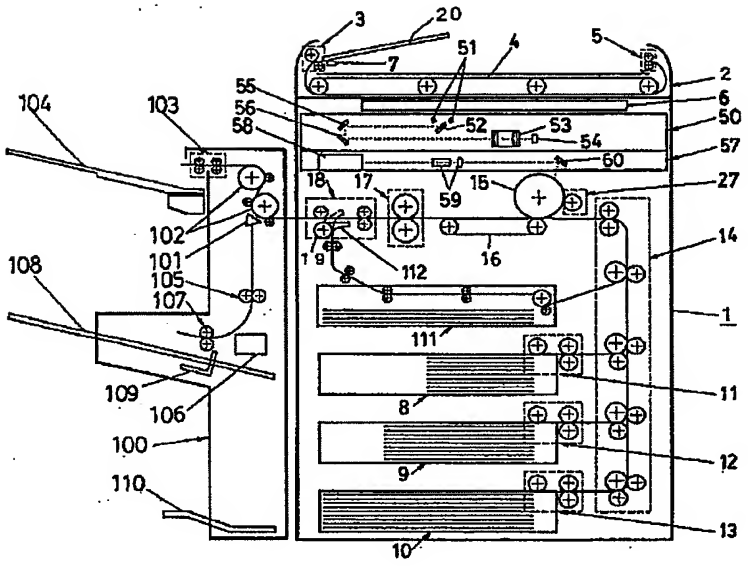
【図１】



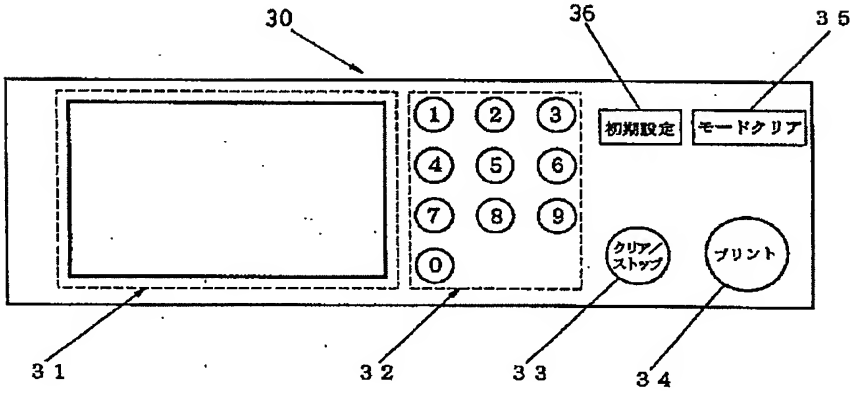
【図７】



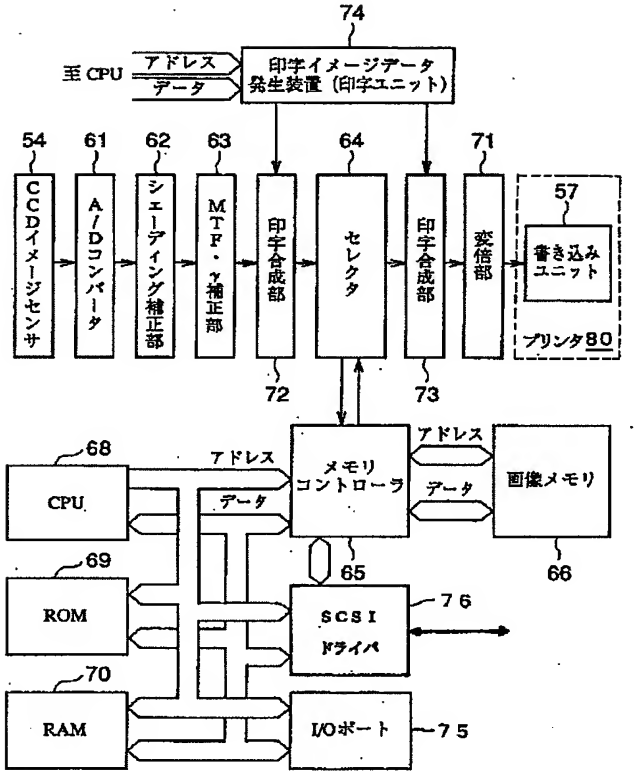
【図２】


3
20
51
4
5
7
2
6
50
57
55
56
58
52
53
54
60
104
103
18
17
59
15
27
102
101
19
112
16
14
108
105
107
1
111
11
109
106
8
12
100
9
110
13
10

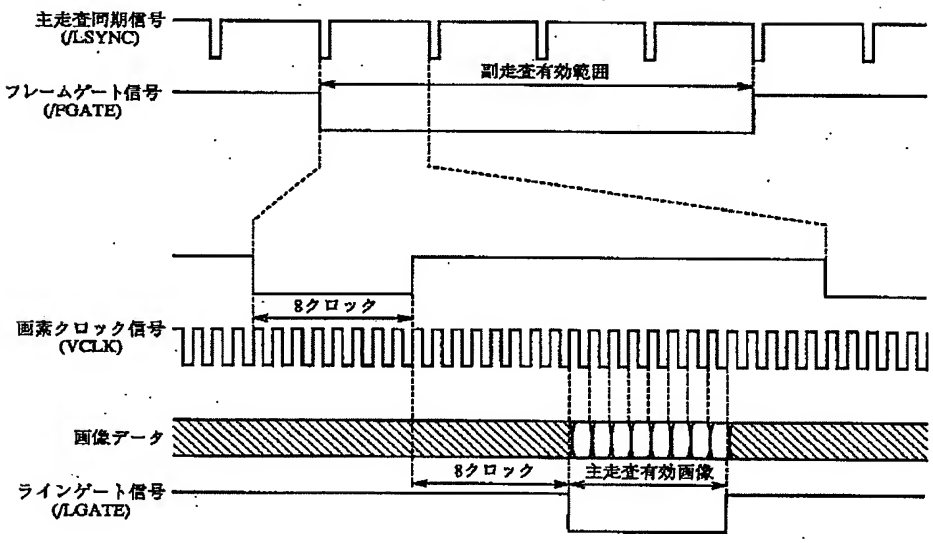
【図３】


30
36
35
初期設定
モードクリア
1
2
3
4
5
6
7
8
9
0
クリア/ストップ
プリント
31
32
33
34

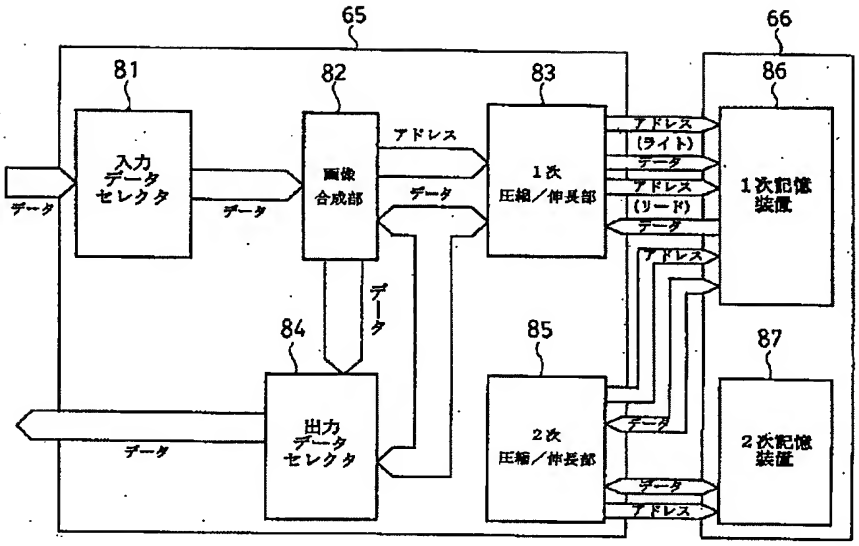
【図４】


74
至 CPU
アドレス
データ
印字イメージデータ発生装置（印字ユニット）
54
61
62
63
64
71
57
CCDイメージセンサ
A/Dコンバータ
シェーディング補正部
MTF・γ補正部
印字合成部
セレクタ
印字合成部
変倍部
書き込みユニット
プリンタ80
72
73
68
CPU
アドレス
データ
メモリコントローラ
アドレス
データ
画像メモリ
65
66
69
ROM
SCSI ドライバ
76
70
RAM
I/Oポート
75

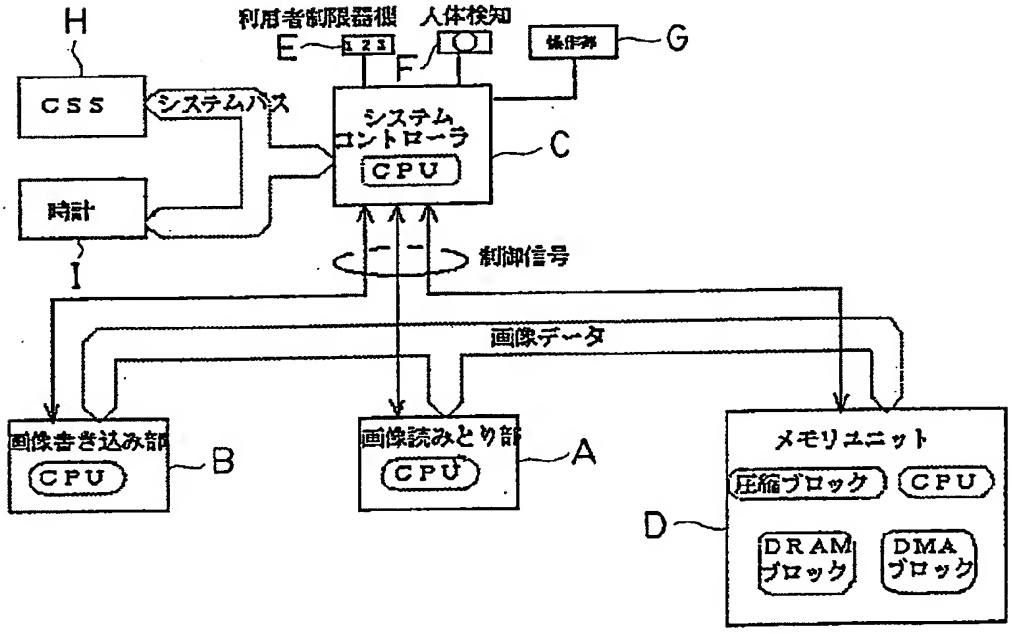
【図５】


主走査同期信号 (/LSYNC)
フレームゲート信号 (/FGATE)
副走査有効範囲
8クロック
画素クロック信号 (VCLK)
画像データ
8クロック
主走査有効画像
ラインゲート信号 (/LGATE)

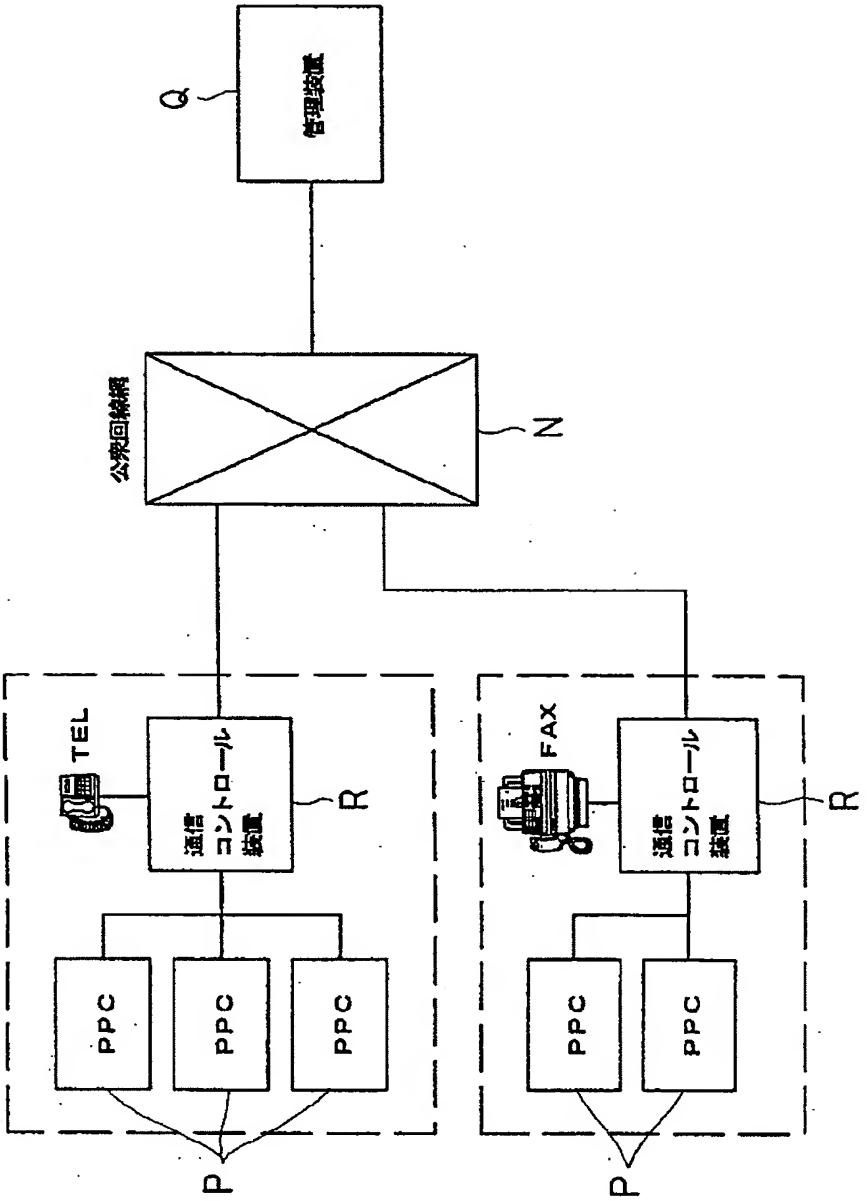
【図６】


65
66
81
82
83
86
入力データセレクタ
画像合成部
アドレス
データ
1次圧縮／伸長部
アドレス(ライト)
データ
アドレス(リード)
データ
1次記憶装置
アドレス
84
85
87
出力データセレクタ
2次圧縮／伸長部
データ
2次記憶装置
データ
アドレス

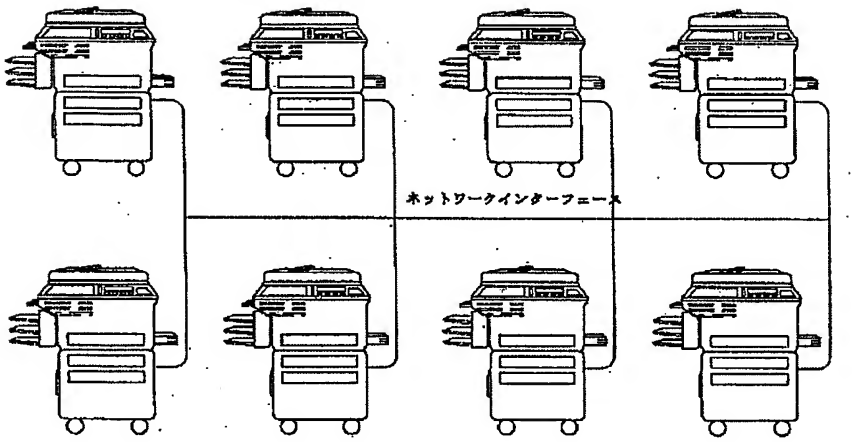
【図８】


H
利用者制限器種
人体検知
E
123
F
操作部
G
CSS
システムバス
システムコントローラ
CPU
C
時計
I
制御信号
画像データ
画像書き込み部
CPU
B
画像読みとり部
CPU
A
メモリユニット
圧縮ブロック
CPU
D
DRAMブロック
DMAブロック

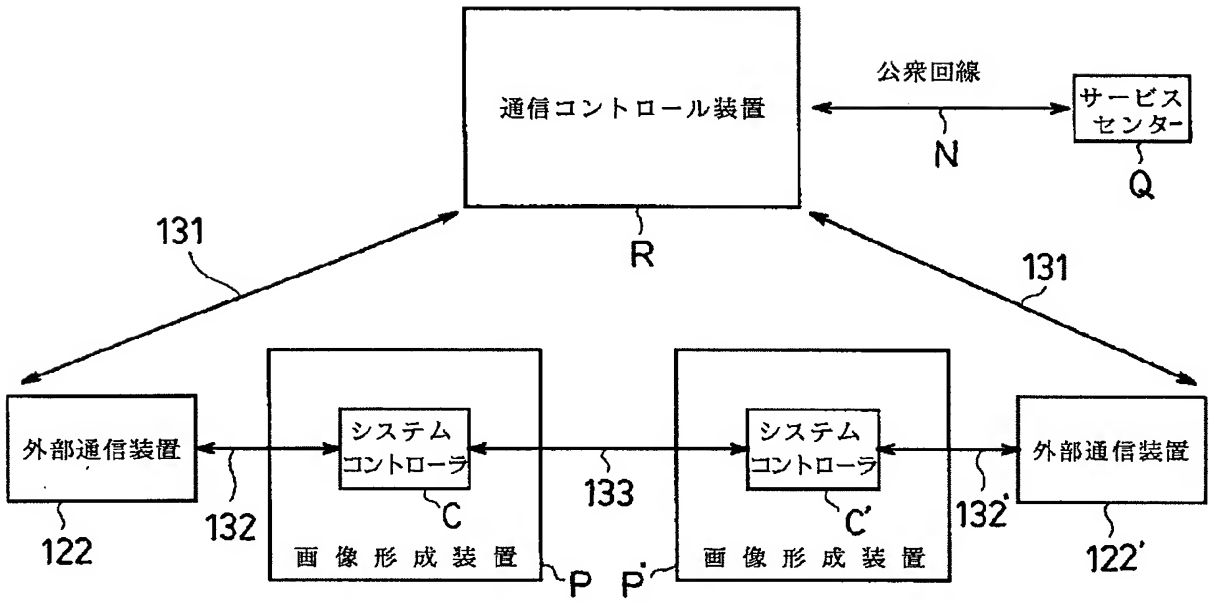
【図９】


Q
管理装置
公衆回線網
N
TEL
通信コントロール装置
R
PPC
PPC
PPC
P
FAX
通信コントロール装置
R
PPC
PPC
P

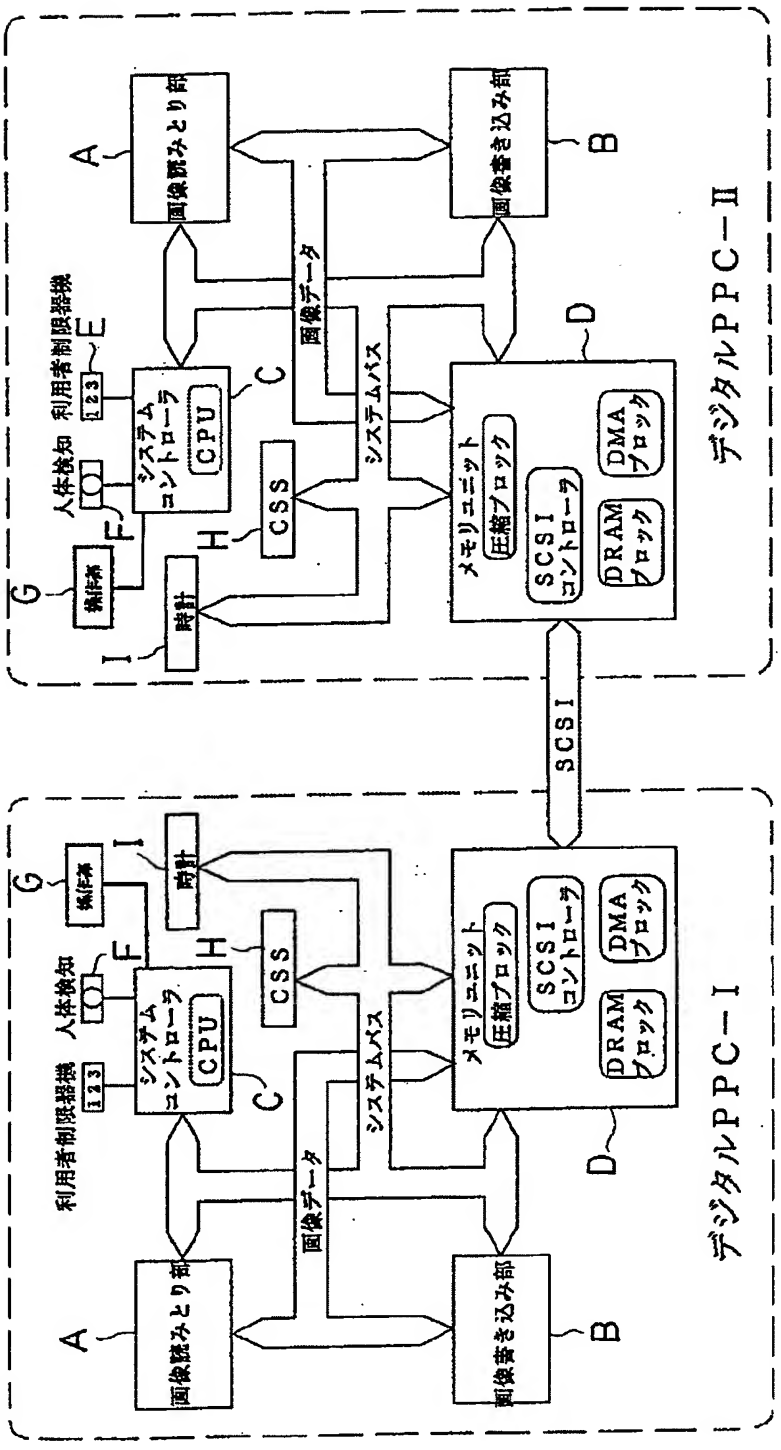
【図１０】


ネットワークインターフェース

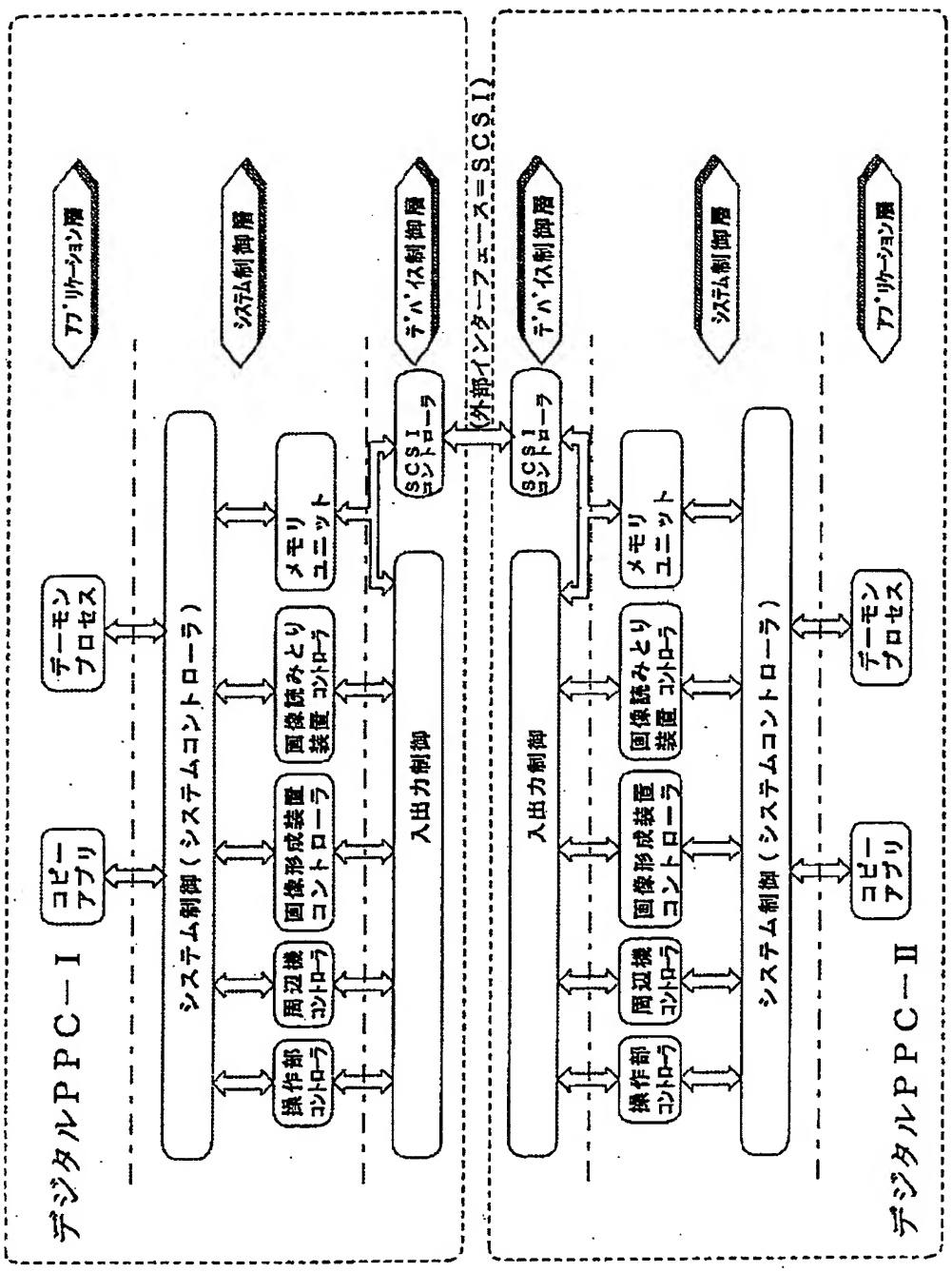
【図１６】


通信コントロール装置
公衆回線
サービスセンター
N
Q
R
131
131
外部通信装置
システムコントローラ
システムコントローラ
外部通信装置
132
133
132'
C
C'
122
122'
画像形成装置
画像形成装置
P
P'

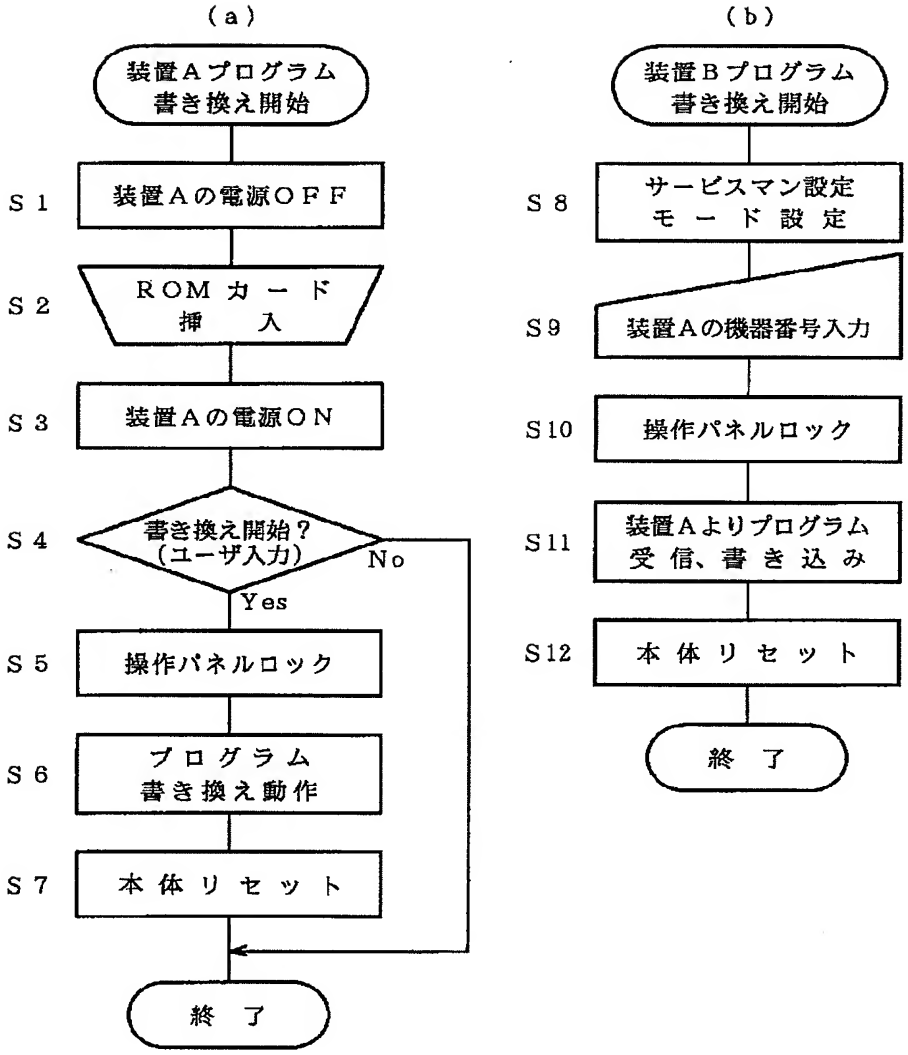
【図１１】


デジタルPPC－II
デジタルPPC－I
SCSI
画像読みとり部
画像書き込み部
システムコントローラ
CPU
CSS
時計
操作部
人体検知
利用者制限器機
123
システムバス
画像データ
メモリユニット
圧縮ブロック
SCSIコントローラ
DMAブロック
DRAMブロック
A
B
C
D
E
F
G
H
I

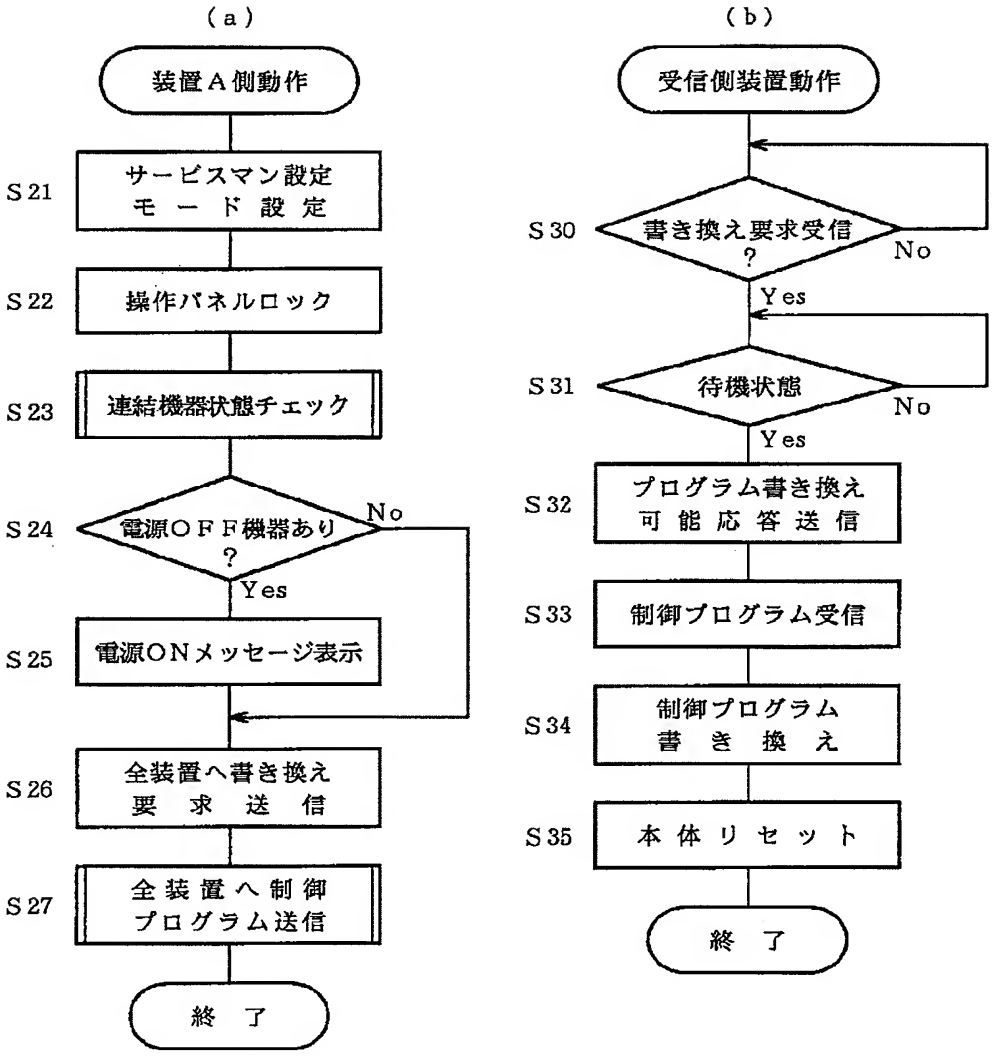
【図１２】


デジタルＰＰＣ－Ｉ
コピーアプリ
デーモンプロセス
アプリケーション層
システム制御層
デバイス制御層
システム制御（システムコントローラ）
操作部コントローラ
周辺機コントローラ
画像形成装置コントローラ
画像読みとり装置コントローラ
メモリユニット
入出力制御
SCSIコントローラ
外部インターフェース＝SCSI）
デジタルＰＰＣ－II

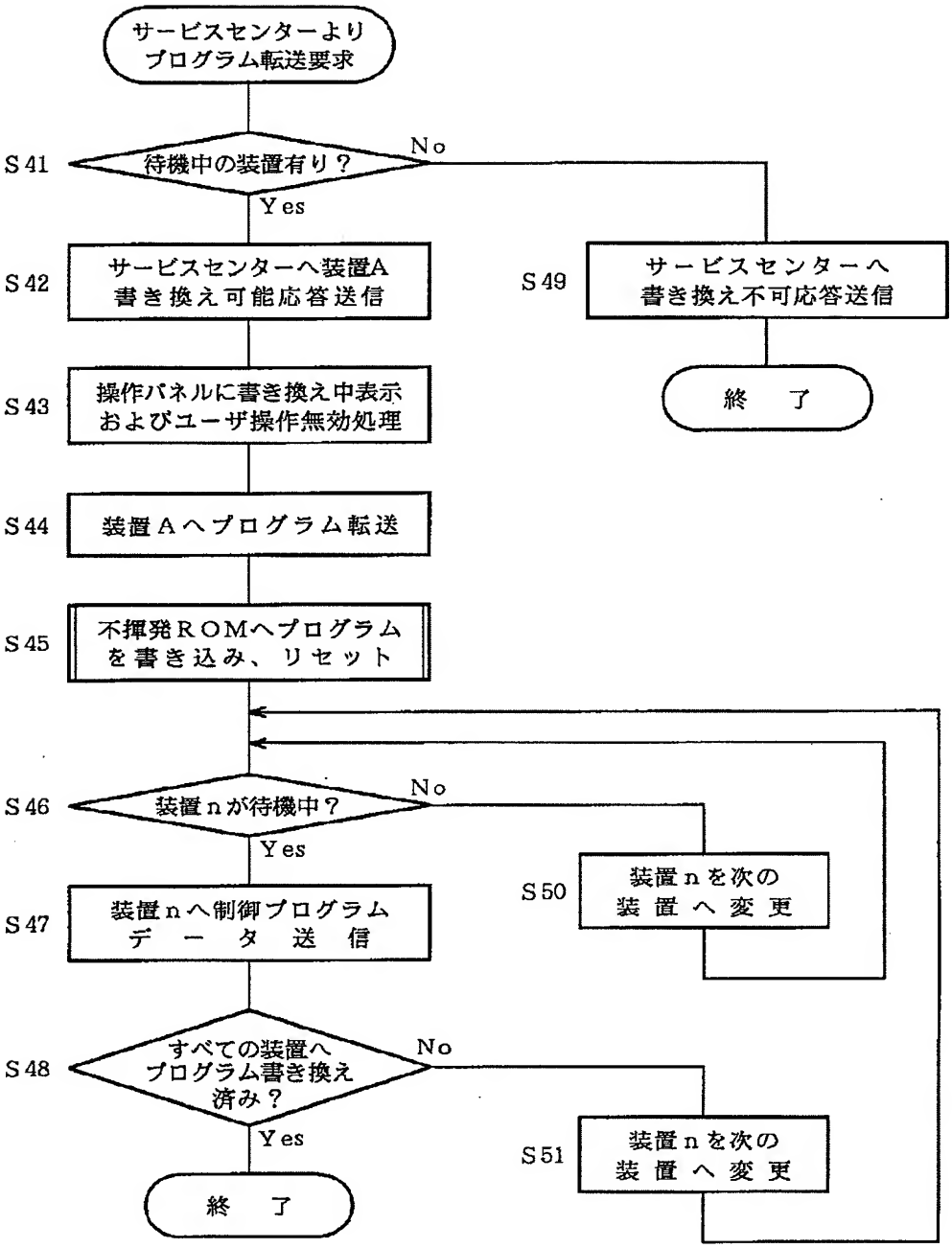
【図１３】


(a)
装置Aプログラム
書き換え開始
S1
装置Aの電源OFF
S2
ROMカード
挿入
S3
装置Aの電源ON
S4
書き換え開始？
(ユーザ入力)
No
Yes
S5
操作パネルロック
S6
プログラム
書き換え動作
S7
本体リセット
終了
(b)
装置Bプログラム
書き換え開始
S8
サービスマン設定
モード設定
S9
装置Aの機器番号入力
S10
操作パネルロック
S11
装置Aよりプログラム
受信、書き込み
S12
本体リセット
終了

【図１４】


(a)
装置Ａ側動作
S21
サービスマン設定
モード設定
S22
操作パネルロック
S23
連結機器状態チェック
S24
電源ＯＦＦ機器あり
?
No
Yes
S25
電源ＯＮメッセージ表示
S26
全装置へ書き換え
要求送信
S27
全装置へ制御
プログラム送信
終了
(b)
受信側装置動作
S30
書き換え要求受信
?
No
Yes
S31
待機状態
No
Yes
S32
プログラム書き換え
可能応答送信
S33
制御プログラム受信
S34
制御プログラム
書き換え
S35
本体リセット
終了

【図１５】


サービスセンターより
プログラム転送要求
S41
待機中の装置有り？
No
Yes
S42
サービスセンターへ装置A
書き換え可能応答送信
S43
操作パネルに書き換え中表示
およびユーザ操作無効処理
S44
装置Aへプログラム転送
S45
不揮発ROMへプログラム
を書き込み、リセット
S46
装置nが待機中？
No
Yes
S47
装置nへ制御プログラム
データ送信
S48
すべての装置へ
プログラム書き換え
済み？
No
Yes
終　了
S49
サービスセンターへ
書き換え不可応答送信
終　了
S50
装置nを次の
装置へ変更
S51
装置nを次の
装置へ変更